



**Pollution**

**By Hossam Ganby**



# Air pollution in the United States



Looking down from the [Hollywood Hills](#), with [Griffith Observatory](#) on the hill in the foreground, air pollution is visible in downtown [Los Angeles](#) on a late afternoon.

[Air pollution](#) is the introduction of [chemicals](#), [particulate matter](#), or [biological materials](#) that cause harm or discomfort to humans or other living organisms, or damages the [natural environment](#) into the [atmosphere](#). Ever since the beginning of the [Industrial Revolution](#) in the United States, America has had much trouble with environmental issues, air pollution in particular.

## Clean Air Acts

In the 1960s, 1970s, and 1990s, the [United States Congress](#) enacted a series of [Clean Air Acts](#) which significantly strengthened regulation of air pollution. Individual U.S. states, some European nations and eventually the [European Union](#) followed these initiatives. The Clean Air Act sets numerical limits on the concentrations of a basic group of air pollutants and provide reporting and enforcement mechanisms.

In 1999, the [United States Environmental Protection Agency](#) (EPA) replaced the Pollution Standards Index (PSI) with the [Air Quality Index](#) (AQI) to incorporate new PM2.5 and Ozone standards.

The effects of these laws have been very positive. In the United States between 1970 and 2006, citizens enjoyed the following reductions in annual pollution emissions:<sup>[1]</sup>

- carbon monoxide emissions fell from 197 million tons to 89 million tons
- nitrogen oxide emissions fell from 27 million tons to 19 million tons
- sulfur dioxide emissions fell from 31 million tons to 15 million tons
- particulate emissions fell by 80%
- lead emissions fell by more than 98%

In an October 2006 letter to EPA, the agency's independent scientific advisors warned that the ozone smog standard "needs to be substantially reduced" and that there is "no scientific justification" for retaining the current, weaker standard. The scientists unanimously recommended a smog threshold of 60 to 70 [ppb](#) after they conducted an extensive review of the evidence.<sup>[2]</sup>

The EPA has proposed, in June 2007, a new threshold of 75 ppb. This is less strict than the scientific recommendation, but is more strict than the current standard.

Some industries are lobbying to keep the current standards in place. Environmentalists and public health advocates are mobilizing to support the scientific recommendations.<sup>[citation needed]</sup>

## International pollution

## Los Angeles Air pollution, Health hazards



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International pollution

Los Angeles Air pollution, Health hazards

[Los Angeles](#) has some of the most contaminated air in the country. (It has won the award for being the “smoggiest city” in the United States for several years).

Due to its high overall population density and traffic congestion, the city’s air is contaminated with toxic chemicals. Studies have shown that traffic-induced pollution is linked to increased likeliness of cancer, along with complications during pregnancy.

Many industries in the area also emit toxic chemicals when manufacturing their products. Although this helps to stimulate the local economy, it comes at the high price of potential health hazards to the general public. A study published in February 2012 states that someone’s risk of having a stroke could be raised by 34% if they had been exposed to at least a “moderate” amount of air pollution that day. This statistic was created after studying the medical records of over 1700 stroke victims.<sup>[4]</sup>

Citizens of Los Angeles consider air pollution to be serious, as over 45% of them believed it to be a “big problem”. A recent poll shows that according to the people of Southern California and more northern areas like the Bay Area and the Central Valley, air pollution is the most important environmental problem that California faces today.<sup>[5]</sup>

The [U.S. Environmental Protection Agency](#) has suggested that national standards regarding air quality be made more stringent. President Obama has not put these suggestions into action, as his administration believes that these stricter standards would damage industry production. Although pollution levels are still extremely high, recent studies have shown there to be a decrease in the amount of pollutants within the last few decades. This is a result of cars becoming cleaner themselves, as gasoline consumption has nearly tripled during this time.

Pollution level rankings

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**adversely affected by air pollution and what can we do to improve air quality?**

— *Tom Weaver, Sioux City, IA*

According to the *State of the Air 2005* report, published by the [American Lung Association](#) (ALA), air pollution levels improved in many parts of the nation

during the first few years of the new millennium, but millions of Americans still face dangerous levels of air pollution.

### Millions of Americans Breathe Unsafe Air

The ALA report highlights the sad fact that, despite pro-environmental sentiment and strong regulations, more than half of the U.S. population lives in counties with unsafe levels of either smog or particle pollution. Smog is the worst offender and is often directly responsible for cases of decreased lung function, respiratory infection, lung inflammation and aggravation of respiratory illness. Some 142.7 million Americans live in counties rated with failing grades by the ALA for this airborne pollutant.

Meanwhile, another 76.5 million Americans live in areas where they are exposed to unhealthy short-term levels of particle pollution. Children and the elderly are especially at risk. Short-term, or acute, exposure to particle pollution has been





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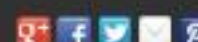
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### The Rig and Deep Water

On April 20, 2010 Deep Water Horizon, a Transocean deep sea drilling rig - working for British Petroleum in the Gulf of Mexico on the Macondo Prospect, which is located on the Mississippi Canyon Block 252, 48 miles from the coast of Louisiana - caught fire, burned fiercely for 36 hours and then sank in 5,000' of water. Eleven oil rig workers died and several others were severely injured. The flames from the rig fire were 200-300 feet high and visible from a distance of 35 miles when the fire was its height.

This accident is producing the largest oil slick in American history, perhaps the largest such disaster anywhere in the history of the oil industry. Oil is leaking out at 200,000 gallons per day. The oil slick tripled in size in one day, from a spill the size of Rhode Island to one as big as Puerto Rico, according to images collected from mostly European satellites and analyzed by the University of Miami. The environmental mess could be larger than the 1989 Exxon Valdez disaster, when an oil tanker spilled 11 million gallons off Alaska's shores. No effective means for containment for the Deepwater Horizon oil slick has been found as of the date of this article.

Written by: merlynne6



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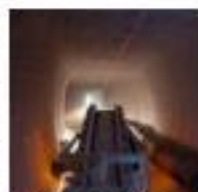
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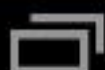
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## WORLD MAYOR

## Half of Americans still affected by dangerous pollution levels

A report by the American Lung Association

**2 May 2011:** Unhealthy air remains a threat to the lives and health of millions of people in the United States, despite great progress. Air pollution lingers as a widespread and dangerous reality even as some seek to weaken the *Clean Air Act*, the public health law that has driven the cuts in pollution since 1970. The *State of the Air 2011* Report by the American Lung Association shows that air quality in many places in the US has improved but that over 154 million Americans, just over one half of the nation, still suffer pollution levels that are often dangerous to breathe.

According to the report four of the most polluted US cities are located in California, with Bakersfield being described as the dirtiest city in the US. The American Lung Association named Cheyenne, Wyoming, as the cleanest city in America. The report looked at levels of ozone and particle pollution found in official monitoring sites across the United States in 2007, 2008, and 2009.

### Overall findings:

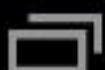
- Roughly half the people (50.3%) in the United States live in counties that have unhealthful levels of either ozone or particle pollution. Almost 154.5 million Americans live in the 366 counties where they are exposed to unhealthful levels of air pollution in the form of either ozone or short-term or year-round levels of particles.
- Roughly one in 17 people - more than 18.5 million in the United States - live in 10 counties with unhealthful levels of all three measures covered in the report: ozone and short-term and year-round particle pollution.
- The strongest improvement came in reducing ozone smog levels across the nation. More than half of the country's most-smog-polluted cities experienced their best year yet. All metro areas in the 25 cities most-polluted by ozone showed improvement over last year's report. Still nearly half the people in the US (48.2%) live in areas with unhealthful levels of ozone pollution.
- All but two of the 25 cities most polluted by year-round levels of particle pollution (sometimes called soot) improved over last year's report. Nineteen of those cities reported their best-ever particle pollution levels.
- Success in reducing short-term particle pollution levels varied among metro areas. Twelve of the most polluted cities saw improvement compared to last year's report, while 17 had worse problems with these spikes in particle levels.

### The most polluted US cities

(By particle pollution)

1 Bakersfield, CA

2 Los Angeles, CA



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The Huffington Post : First Posted: 05/03/11 10:09 AM ET : Updated: 07/03/11 06:12 AM ET



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Just how dirty is the air you breathe?

The [American Lung Association](#) (ALA) has released their annual report, State of the Air 2011, highlighting which cities have the worst air for ozone pollution, short-term particle pollution, and year-long particle pollution. All of these pollutants present problems for the health of the people living near these regions (and sometimes, *not* near these regions).

This slideshow highlights the 11 cities (there were some ties) ranked in the SOTA 2011's list of "10 Cities Most Polluted by Year-Round Particle Pollution." According to the report, over 18.5 million people in the U.S. live in a region with unhealthy levels of year-round particle pollution.

From the report:

These people live in areas where chronic levels are regularly a threat to their health. Even when levels are fairly low, exposure to particles over time can increase risk of hospitalization for asthma, damage to the lungs and, significantly, increase the risk of premature death.

The ALA recently reported that particle pollution from power plants kills approximately **13,000 people** per year.

Pollution hazards may be exacerbated for people who are part of an "at-risk" group, such as those with asthma, chronic lung disease, cardiovascular disease, or diabetes. The ALA has also found that people who live in poverty may face higher risk from air pollution. [Click here for more information](#) on the SOTA 2011 report, or visit the [SOTA website](#).

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Total Population: 510,385  
Under 18: 149,225  
65 and Over: 53,538  
Pediatric Asthma: 9,899  
Adult Asthma: 28,322  
Chronic Bronchitis: 15,267

### This Report

Rank #10 | Average: 4.9

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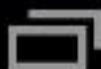


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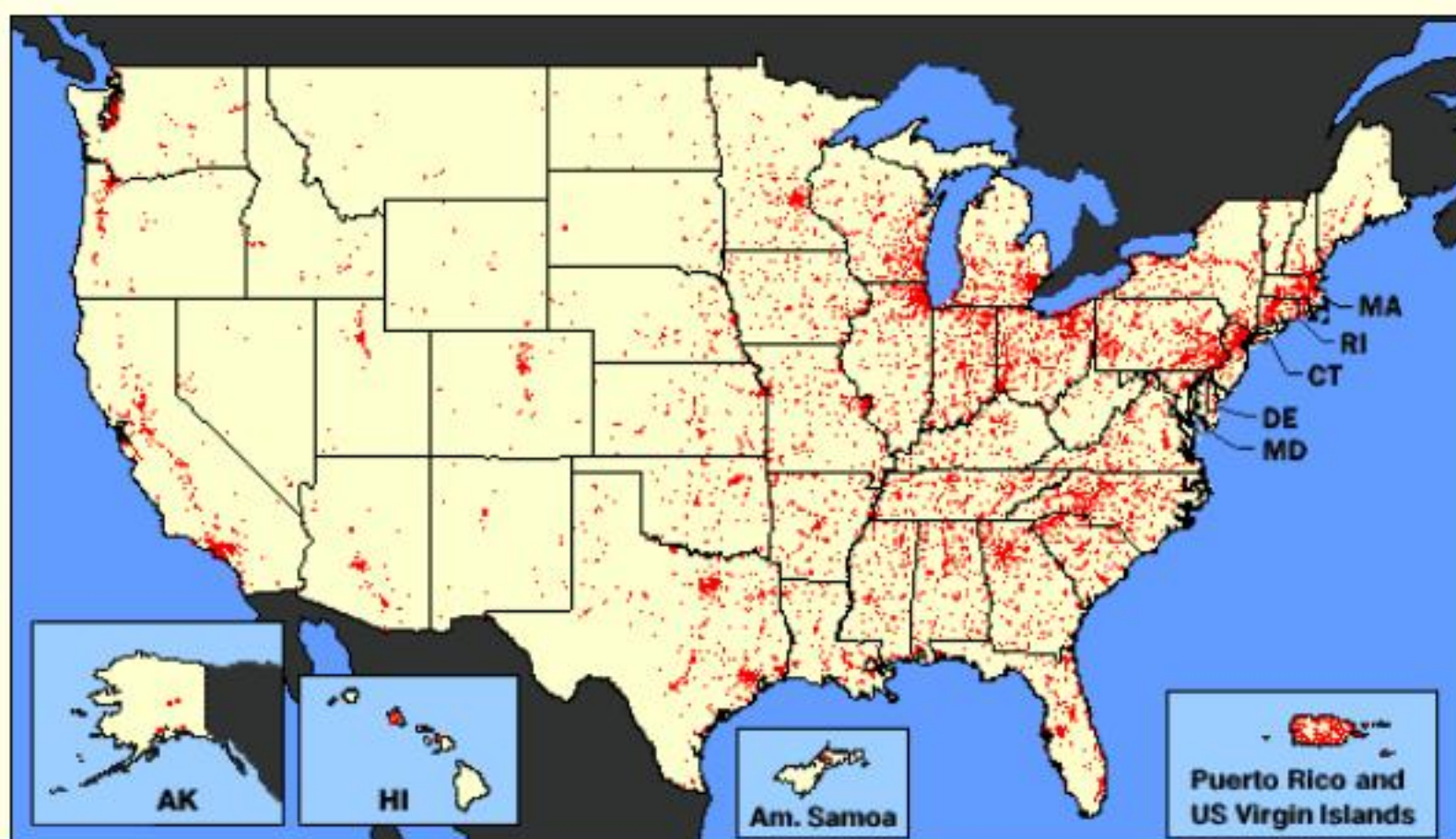




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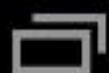
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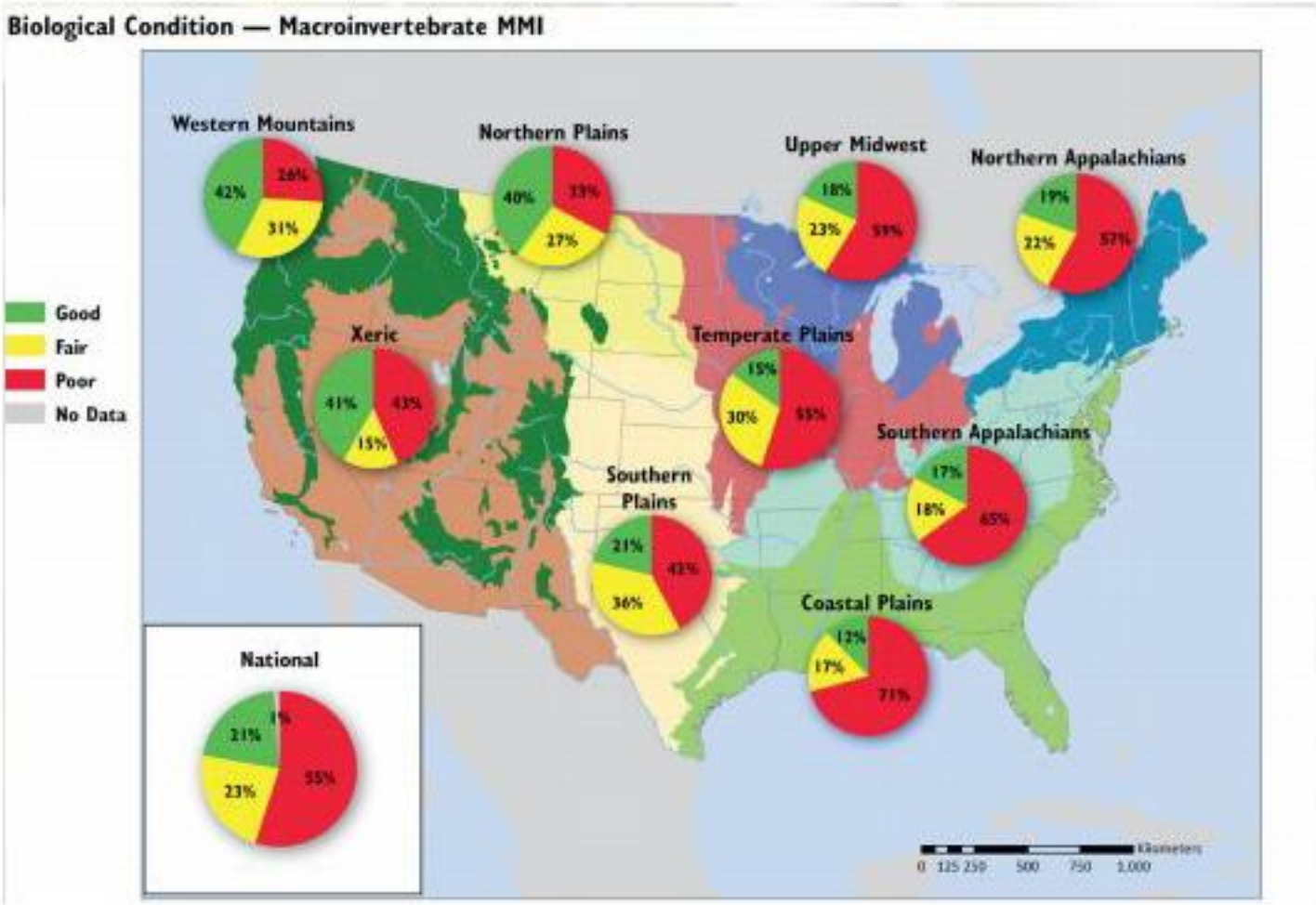


# Half of All U.S. Rivers Are Too Polluted for Our Health

BY [DASHIELL BENNETT](#) | MAR 27, 2013

A new report by the Environmental Protection Agency found that the majority of rivers and streams in this country can't support healthy aquatic life and the trend is going in the wrong direction. The report labels 55 percent of the nation's water ways as being in "poor" condition and another 23 percent as just "fair." Only 21 percent of rivers are considered "good" and "healthy biological communities." Even worse, the number of rivers and streams that qualify as "good" went down seven percent between 2004 and 2009.

The reason for these failing grades is, of course, pollution; specifically, phosphorus and nitrogen pollution that comes from fertilizer and wastewater run-off. Those chemicals, which come from farms and industrial sites, choke off healthy plant growth, which turn leads to more soil erosion, more flooding, and unhealthy fish and wildlife.



The pollution filters down to humans too, since that's the water we drink and the animals we eat. The study also found increased bacteria that in some areas "exceeds thresholds protective of human health" and another 13,000 miles of the rivers that have fish with unhealthy amounts of mercury in them. The worst areas for river pollution are the Northeast and deep South, where a shocking 71 percent of rivers rated "poor."

One of the major indicators of the decline of healthy aquatic life is the decline in water-borne insects. By measuring the declining health of the insect populations, environmentalists take that as warning sign that other wildlife will soon follow.



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## Pollution in the U.S.A

Pure Writing

Sun March 18th, 2007

In today's society we have a number one problem which is affecting everyone, everyday. And, the problem is pollution. Pollution is everywhere and it's affecting our health, and environment, day by day. And, I'm going to tell you how to prevent pollution, and how it affects our lives, and how pollution benefits our complex society.

### Pollution In The U.S.A. #1

Pollution is really everywhere you look, unless you live up in the mountains of Montana. Pollution is giving out by our cars every morning on our way to work. And, one of the main producers of pollution is chemical plants, and refineries, or any other form of factories that produces products at large quantities. That require huge engines to run twenty-four hours a day to meet deadlines. And, as long as there is a demand for products or oil there will always be pollution.

### Pollution In The U.S.A. #2

Our, health is also in danger, when it comes to pollution. Because, we breathe it every day, likes it's fresh air or something, "even though it smells bad." There is also a lot of people who retire from big oil refineries after working as process operators, and they end up catching cancer, from their work. Maybe that's why it takes so long to cure from the flu in areas with a lot of pollution. And, there is other effects but, it's only going to take time to fix all of these problems.

### Pollution In The U.S.A. #3

When, it comes to the environment, pollution plays a big role. Because, its affecting our clean water, in rivers and canals. And, it's also affecting our ozone layer, day by day. But, these are issues that are already being addressed, but it's very difficult to actually make a big difference, with the U.S. pollution growing so much every year.

### Pollution In The U.S.A. #4

You, can help by reducing pollution, "believe it or not." By carpooling which, will only reduces the amount of smog in the air. And, by buying smaller cars, that burn less gas compared to big SUVs. And, public transportation is also a good idea. If they have a city-public- bus in your city, it's a good idea to use it more often.

### Pollution In The U.S.A. #5

But, pollution is also benefits this complex society by, providing jobs, careers, and income to people who are just starting out in life. And, it's keeping people productive, to build the U.S. a better country.

So, it's very hard not to have pollution, because we have to have it to be productive every year. But, with new technologies I think one day we can get many of these issues solved.

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## America's 10 Most Polluted States

By [Jen Alic](#) | Thu, 06 September 2012 22:45 | 6



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Do you know where you live? Half of all industrial toxic air pollution comes from power plants and 6,700 power plants and heavy industries are responsible for 80% of all greenhouse gas emissions in the United States. Coal- and oil-fired power plants contribute 44% of all toxic air pollution. Toxic mercury and emissions from the country's electricity sector are estimated to cause tens of thousands of premature deaths, heart attacks, asthma cases and chronic bronchitis every year.

While there are varying lists of America's most toxic, we'll focus on the latest top 10 list from the Natural Resources Defense Council ([NRDC](#)), which ranks states in terms of overall industrial pollution, along with reporting from the Environmental Protection Agency (EPA).

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Many of the US' most toxic states have seen a reduction of pollution over the past several years, but a federal court of appeals ruling to scrap an EPA regulation on "Cross-State Air Pollution", designed to reduce air pollution carried from one state to another. Power plants had been expecting this ruling to be approved for over a year, and had adjusted their practices accordingly. The immediate reaction to the federal court's scrapping of the rule resulted in a queuing up of power plants to abandon preparations for this compliance. Likewise, the EPA's Mercury and Air Toxics standards (MATs), designed to cut mercury air pollution beginning in 2015 by 79% from 2010 levels failed in the Senate in June.

So where are we now? Well, we're stuck with this list of states that are the most toxic, and while much progress has been made, the list is likely to contain the usual suspects next year and fewer improvements on pollution.





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### Number 1: Ohio

Ohio's electricity-generation sector emitted more than 36.4 million pounds of harmful chemicals in 2010, accounting for 62% of state pollution and about 12% of toxic pollution from all US power plants. The state also ranked 2nd in industrial mercury air pollution from power plants, emitting almost 4,210 pounds in 2010 (73% of the state's mercury air pollution and 6% of US electricity sector mercury pollution).

Ohio is home to the Gen J M Gavin coal plant in Cheshire, which is the 9th biggest polluter in the United States, according to the EPA, which estimates the plant's greenhouse

gas emissions for 2010 at 16,872,856 CO<sub>2</sub>e.

### Number 2: Pennsylvania

Pennsylvania is ranked third on the second annual "Toxic 20" ranking of states whose residents are exposed to the most pollution from coal- and oil-fired power plants. It represents a small improvement over last year, when Pennsylvania ranked second in the nation in the percentage of toxic pollution generated by power plants. Pennsylvania is responsible for some 10% of all toxic pollution from power plants in the US, releasing nearly 32 million pounds of harmful chemicals in 2010 alone.

From 2009 to 2010, air pollution from all sources in Pennsylvania dropped by 20 percent and from coal-fired power plants by 24%, according to HRDC.

### Number 3: Florida

While the EPA ranked Florida the 6th worst polluter in 2010, the NRDC ranked it as 2nd worst in its 2012 list. Florida's electricity-generation sector emitted nearly 16.7 million pounds of harmful chemicals in 2010, according to the EPA, accounting for 57% of all state pollution and 5% of toxic pollution from all US power plants. Florida's electricity sector emitted some 1,710 pounds of mercury into the air, accounting for 75% of the entire state's mercury air pollution for that same year.

Florida has undergone a major shift from coal to natural gas. Twelve years ago, natural gas accounted for less than 30% of Florida's electricity production. By 2011, Florida was generating 62% of its total power from natural gas, with coal accounting for 23%. (Only Texas has a higher percentage). Florida has three nuclear power plants, which accounted for just under 10% of electricity generation in 2011. Florida has 10 large power plants, eight of which are now fueled by natural gas.

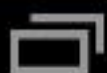
However, despite the shift from coal to natural gas, Florida's carbon dioxide emissions have continued to increase, while sulfur dioxide emissions have been reduced. Florida has seen its greenhouse gas emissions increase from 91 million tons in 1990 to 124 million tons in 2010.

### Number 4: Kentucky

Kentucky may not have been ranked the worst overall polluter in the US, but it is ranked worst in terms of toxic air pollution from coal-fired power plants, with HRDC officials specifically citing Kentucky's poor control over these plants and its failure to adopt any laws or regulations that would lead to a notable reduction in pollution.

Kentucky's electricity sector actually saw an increase in toxic air pollution from 8.8 million pounds in 2009 to 9.6 million pounds in 2010.

It's not likely to improve much. Just one day after a federal appeals court scrapped the EPA rule to curb long-distance power plant pollution drifting, the Kentucky-based Big Rivers Electric Cooperative power







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It's not likely to improve much. Just one day after a federal appeals court scrapped the EPA rule to curb long-distance power plant pollution drifting, the Kentucky-based Big Rivers Electric Cooperative power plant announced it would [abandon](#) pollution controls that would have allowed it to comply with the EPA's regulation.

#### Number 5: Maryland

Ranked 5th overall for total industrial pollution, coal-burning power plants keep Maryland higher on the pollution list than the state would like. In terms of coal-burning power plant pollution, Maryland is ranked 19th by the NRDC, which also noted that the state's toxic emissions from power plants dropped by 88% over the course of one year. The biggest polluters are the Chesterfield, Chesapeake and Clinch River power plants.

#### Number 6: Indiana

The Gibson coal plant in Owensville had total greenhouse gas emissions of 17,993,350 CO<sub>2</sub>e in 2010, according to the EPA, which ranked the plant the fifth worst polluter in the US. The state's Rockport coal plant ranked the 10th worst polluter in the country, with total greenhouse gas emissions of 16,666,035 CO<sub>2</sub>e.

#### Number 7: Michigan

Michigan's electricity sector emitted over 15.5 million pounds of harmful chemicals, which translates into 61% of all state pollution and 5% of power plant pollution countrywide. The sector also caused around 2,250 pounds of mercury air pollution, which is 82% of the state's entire mercury air pollution and 3% of the country's electricity sector mercury pollution.

The Monroe coal plant registered total greenhouse gas emissions 17,850,341 CO<sub>2</sub>e with the EPA in 2010, making it the country's 6th worst polluter.

Michigan has not increased or reduced pollution in the electricity sector since the last ranking in 2009. The only thing saving Michigan's air—a decline in manufacturing, which of course is not the ideal.

#### Number 8: West Virginia

West Virginia's electrical power generation was responsible for over 80% of toxic industrial air pollution in the state, while the chemical sector was responsible for 10%. In 2010, West Virginia's electricity sector emitted 18.1 million pounds of harmful chemicals, or 81% of all state pollution and 6% of the country's total power plant pollution. In terms of mercury air poisoning, 2,500 of toxic mercury were released into the air in 2010.

The biggest polluters are power plants owned by Allegheny Energy, AEP and Dominion.

Incidentally, West Virginia has the highest per capita mortality risk from fine particle pollution among states.

#### Number 9: Georgia







over the course of one year. The biggest polluters are the Chesterfield, Chesapeake and Clinch River power plants.

#### Number 6: Indiana

The Gibson coal plant in Owensville had total greenhouse gas emissions of 17,993,350 CO<sub>2</sub>e in 2010, according to the EPA, which ranked the plant the fifth worst polluter in the US. The state's Rockport coal plant ranked the 10th worst polluter in the country, with total greenhouse gas emissions of 16,666,035 CO<sub>2</sub>e.

#### Number 7: Michigan

Michigan's electricity sector emitted over 15.5 million pounds of harmful chemicals, which translates into 61% of all state pollution and 5% of power plant pollution countrywide. The sector also caused around 2,250 pounds of mercury air pollution, which is 82% of the state's entire mercury air pollution and 3% of the country's electricity sector mercury pollution.

The Monroe coal plant registered total greenhouse gas emissions 17,850,341 CO<sub>2</sub>e with the EPA in 2010, making it the country's 6th worst polluter.

Michigan has not increased or reduced pollution in the electricity sector since the last ranking in 2009. The only thing saving Michigan's air—a decline in manufacturing, which of course is not the ideal.

#### Number 8: West Virginia

West Virginia's electrical power generation was responsible for over 80% of toxic industrial air pollution in the state, while the chemical sector was responsible for 10%. In 2010, West Virginia's electricity sector emitted 18.1 million pounds of harmful chemicals, or 81% of all state pollution and 6% of the country's total power plant pollution. In terms of mercury air poisoning, 2,500 of toxic mercury were released into the air in 2010.

The biggest polluters are power plants owned by Allegheny Energy, AEP and Dominion.

Incidentally, West Virginia has the highest per capita mortality risk from fine particle pollution among states.

#### Number 9: Georgia

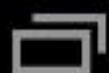
According to the EPA, Georgia's Scherer coal-fired power plant near Macon is the number one producer of greenhouse gases in the United States, emitting 22.8 million metric tons of carbon dioxide alone in 2010.

Georgia is also home to the second worst polluter in terms of carbon dioxide emissions, with its Bowen Plant in Cartersville, which boasted total greenhouse gas emissions of 21,026,397 in 2010. This plant was also listed as the largest emitter of sulfur dioxide in 2006 and blamed for a variety of health issues, from asthma, bronchitis and heart disease to lung disease and pneumonia. Plans are reportedly under way for the installation of scrubbers on the plant's four cooling towers to remove sulfur dioxide from exhaust before it is released into the air.

#### Number 10: North Carolina

North Carolina's electric sector ranked 8th in industrial toxic air pollution in 2010, emitting more than 14.6 million pounds of harmful chemicals, or 48% of state pollution and about 5% of total US toxic pollution from power plants. In terms of mercury air pollution from power plants, North Carolina ranked 24th, producing some 960 tons of toxic mercury in 2010, or 47% of mercury air pollution in the state.

By. Jen Alic of Oilprice.com







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SPECIAL REPORT



The Smokestack Effect

# Toxic Air and America's Schools

USA TODAY used an EPA model to track the path of industrial pollution and mapped the locations of almost 128,000 schools to determine the levels of toxic chemicals outside. The potential problems that emerged were widespread, insidious and largely unaddressed.

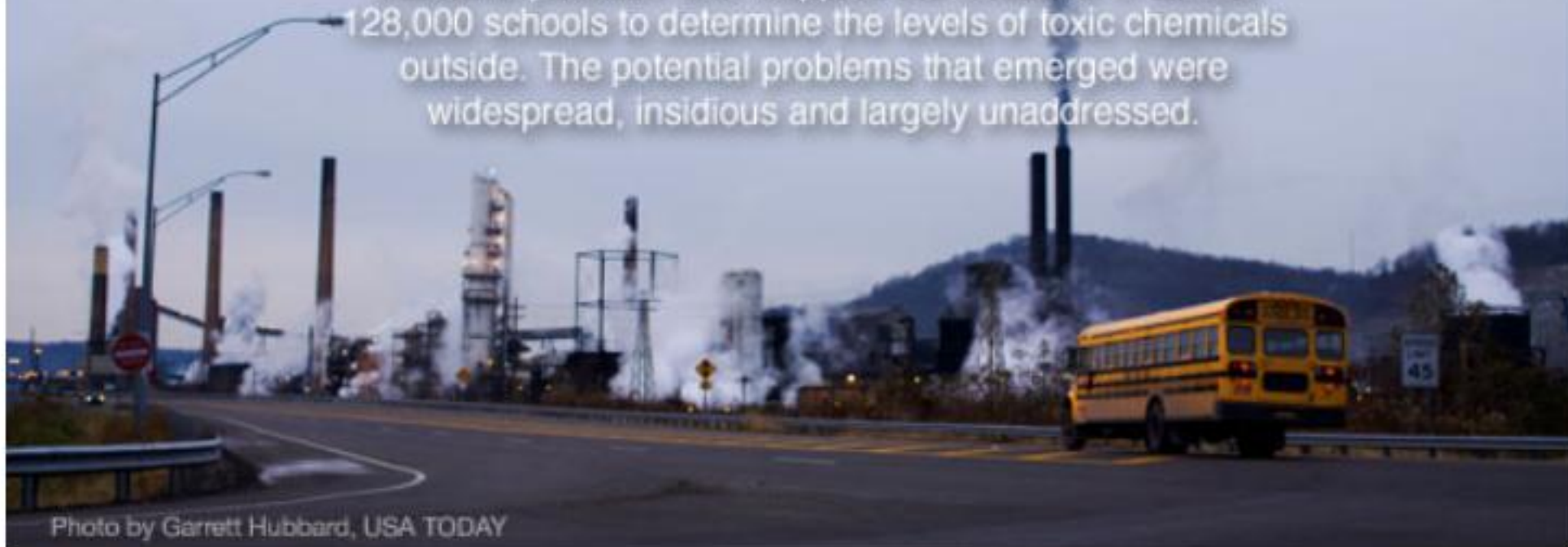


Photo by Garrett Hubbard, USA TODAY

Find your school

\* required

School Name

City/County

\* Select a State

Search

■ Methodology

■ Q and A

Most polluted schools by state



Latest Stories



Latest Multimedia

## Schools near industry face chemical peril

The exposure to toxic chemicals in the air outside some schools appears so high that students could be at risk of suffering a range of ailments, from asthma to cancer.



## 'Weird' smell set off investigation at Ohio school

After an annual Oktoberfest celebration at school, parents pushed for action to address pollution issues.

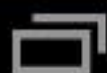
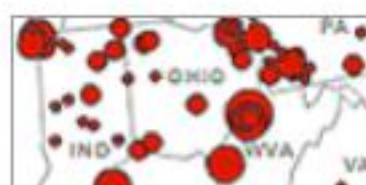
## Video: Toxic chemicals outside our schools

USA TODAY examines the impact of industrial pollution outside the nation's schools and explores how toxic chemicals shuttered one elementary school in Addyston, Ohio, three years ago.



## Schools that ranked worst

A USA TODAY analysis of EPA data indicated that the air outside these schools had the highest levels of



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## SPECIAL REPORT

## The Smokestack Effect

Toxic Air and America's Schools

Find your school

School Name

City/County

# Toxic Chemicals Outside Our Schools

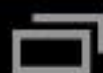
Video by Garrett Hubbard, Steve Elfers, Denny Gainer, and Rhyne Piggott

USA TODAY examines the impact of industrial pollution outside the nation's schools and explores how toxic chemicals shuttered one elementary school in Addyston, Ohio, three years ago.

USA TODAY TRAVEL  
EXPERIENCE LAS VEGASwhere to stay  
what to do  
how to choose

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Contact u



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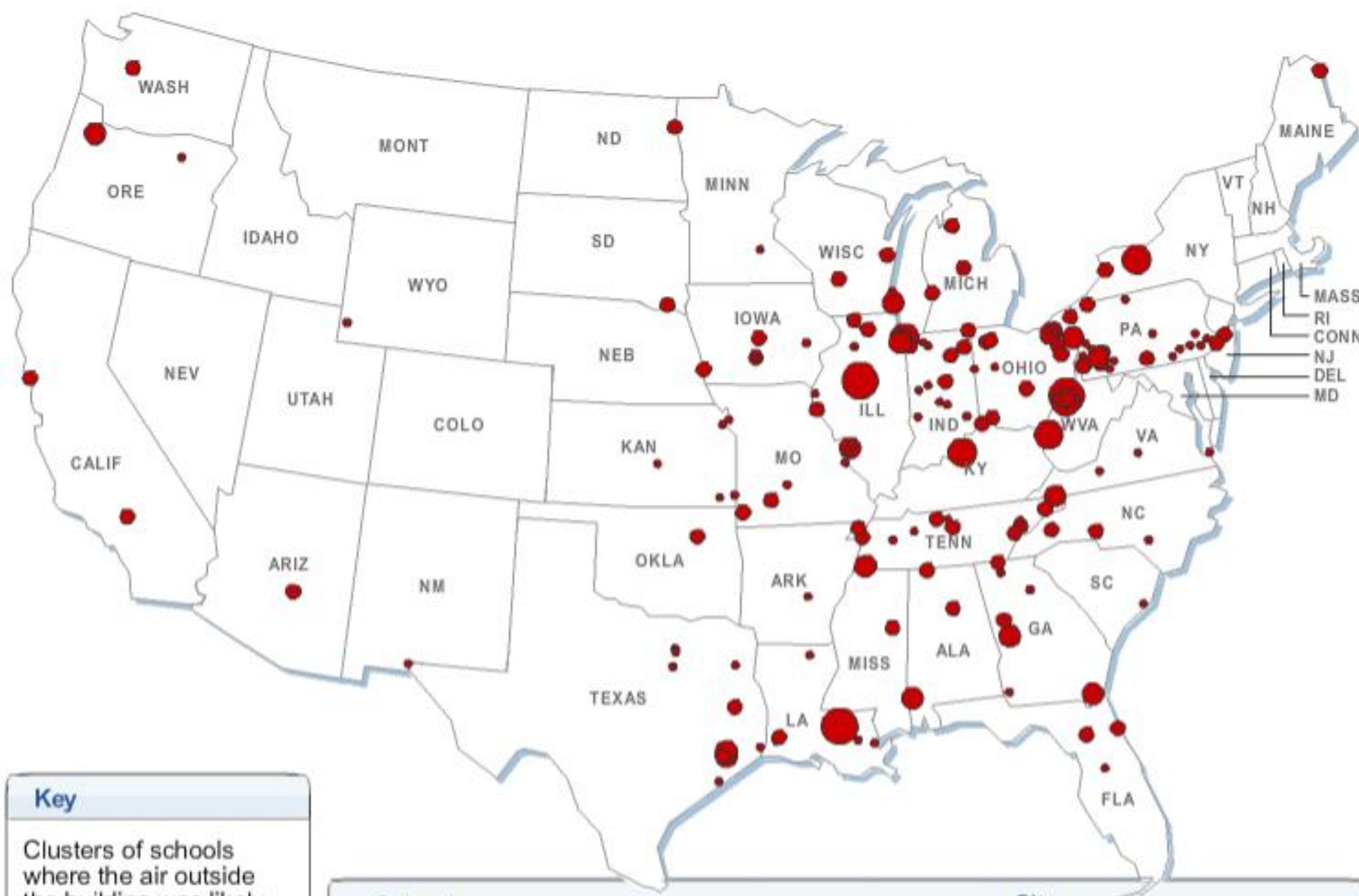
**SPECIAL REPORT**  
**The Smokestack Effect**  
 Toxic Air and America's Schools

Find your school



# Schools that ranked worst

A USA TODAY analysis of EPA data indicated the air outside these schools had the highest levels of dangerous toxic chemicals, most of which have never been tested for their effects on children.



**Key**

Clusters of schools where the air outside the building was likely to be worse than the air at **Meredith Hitchens Elementary**.

- 1
- 2-4
- 5-7
- 8-10
- 11-14

School

City

Choose a state above.

Sources: USA TODAY analysis of EPA data

Produced by David Evans, Brad Heath, Chad Palmer and Rhyne Piggott, USA TODAY





## Latest Stories

**Schools near industry face chemical peril**

The exposure to toxic chemicals in the air outside some schools appears so high that students could be at risk of suffering a range of ailments, from asthma to cancer.

**'Weird' smell set off investigation at Ohio school**

After an annual Oktoberfest celebration at school, parents pushed for action to address pollution issues.

**No one knows what level of chemicals harms children**

Most safety assessments based on the effect chemicals have on adults in workplace, not on kids at school.

**Air tests reveal elevated levels of toxics at schools**

The exposure to toxic chemicals in the air at some schools is so high that students are at risk of suffering a range of ailments, from asthma to cancer.

**Officials vow air near schools will be tested for toxics**

The chairman of the Senate Environment and Public Works Committee, Barbara Boxer, pledges to "do what I have to do" to ensure monitoring across the U.S. Boxer calls lack of monitoring a "shocking story of child neglect."

**Cooperation helped Louisville pull off a cleanup coup**

For years, Louisville has been known for fast horses, fine bourbon, a love of college basketball — and lousy air.

**Young students often most vulnerable to toxic air**

USA TODAY found 20,000 schools within a half-mile of a major industrial plant that emits potentially dangerous chemicals. Many of those locations are elementary or



## Latest Multimedia

**Video: Toxic chemicals outside our schools**

USA TODAY examines the impact of industrial pollution outside the nation's schools and explores how toxic chemicals shuttered one elementary school in Addyston, Ohio, three years ago.

**Schools that ranked worst**

A USA TODAY analysis of EPA data indicated that the air outside these schools had the highest levels of dangerous toxic chemicals, most of which have never been tested for their effects on children.

**Schools can be hit by chemicals from several industries**

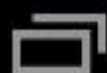
Each refinery, steel mill or factory that emits a significant amount of toxic chemicals must report how much it releases each year to the Environmental Protection Agency. EPA periodically calculates how those chemicals are dispersed through every square kilometer throughout the country.

**Video: Leading health expert explains how to use information**

Dr. Philip J. Landrigan, Chairman of the Department of Community and Preventive Medicine at the Mount Sinai School of Medicine, talks about what parents and authorities can do with information about toxic chemicals that might be outside their schools.

**Video: A snapshot of what's in the air**

USA TODAY monitors for chemicals outside almost 100 schools around the nation. Its findings, experts say, should prompt the government to take a harder look.







SPECIAL REPORT  
The Smokestack Effect  
Toxic Air and America's Schools



Stories in the series ▼



Multimedia ▼



Schools by state



Lisa Frye opposes an energy company's plan to build a coke plant near an elementary school in Middletown, Ohio.

By Bruce A. Crippen for USA TODAY

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## Possible air hazards rarely considered in plans for schools

By Brad Heath, Blake Morrison and Dan Reed, USA TODAY

SPRINGDALE, Ark. — The battle over whether to build Bayyari Elementary School and the subdivision that surrounds it here was fought for the usual reasons before the school opened in 2004: Neighbors worried about sprawl and crime, and the city worried about dust and noise.

No one considered whether high levels of toxic chemicals might be in the air.

No law told them they should.

Had parents, school officials or regulators checked pollution reports from area companies on file with the [U.S. Environmental Protection Agency](#), they might have noticed that the school sits in a section of the city where the air appeared to be tainted by toxic chemicals such as chromium and nickel.

"Nobody mentioned that to us," says Ronnie Bradshaw, an assistant superintendent of Springdale's schools. "If we thought there was an issue, we would have looked before we bought the property. If something's going to hurt kids, we'll address it."

USA TODAY spent eight months examining the impact of industrial pollution on schools across the nation and used a [government computer simulation](#) to identify schools in potential toxic hot spots, a task the EPA has never undertaken.

**Q&A:** [Reporter Blake Morrison takes your questions](#)

The newspaper identified 435 schools in locations where the air outside appeared more dangerous than at an Ohio elementary school

### USA TODAY DIALOGUE

■ **CHAT:** Reporter Blake Morrison joined the conversation about the air around schools today. Read his responses to your questions and comments.



■ **DATABASE:** Check your community for the smokestack effect | **FEEDBACK:** How are you using our interactive database?



Enlarge By Spencer Tirey for USA TODAY

A bus waits at Bayyari Elementary School in Springdale, Ark., for children to get out

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# EPA finds manganese threat at 2 schools

Updated 10/29/2009 2:35 AM | Comment

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By Blake Morrison and Brad Heath, USA TODAY



**SPECIAL REPORT**  
**The Smokestack Effect**  
Toxic Air and America's Schools

## What might be in the air outside your school?

Search for a school to see the toxic chemicals that government data indicated were in the air outside.

School Name

City/County

Select a State



**Search**

*Required field*

Environmental Protection Agency's efforts to check for chemicals outside schools across the nation.

Government scientists have determined that long-term exposure to manganese can cause mental disabilities and emotional problems, especially in kids.

The preliminary results, to be released today, found average manganese levels at least 70% higher than what the EPA considers safe for long-term exposure outside Warren Elementary School in [Marietta, Ohio](#), and Neale Elementary School in Vienna, W.Va.

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## Protecting Clean Water



Dirty water is the world's biggest health risk, and continues to threaten both quality of life and public health in the United States. When water from rain and melting snow runs off roofs and roads into our rivers, it picks up toxic chemicals, dirt, trash and disease-carrying organisms along the way. Many of our water resources also lack basic protections, making them vulnerable to pollution from factory farms, industrial plants, and activities like

fracking. This can lead to drinking water contamination, habitat degradation and beach closures. NRDC is working to protect our water from pollution by:

- Drawing on existing protections in the Clean Water Act, and working to ensure that the law's pollution control programs apply to all important waterways, including headwater streams and wetlands, which provide drinking water for 117 million Americans;
- Improving protections to reduce pollutants like bacteria and viruses, which threaten Americans' health and well being; and
- Establishing new pollution limits for top problem areas, such as sources of runoff and sewage overflows.

» *Check out our guide on water quality at vacation beaches*

» *12 simple things you can do to reduce water pollution*

## Promoting Water Efficiency



Despite the many existing pressures on our water resources, there are cost-effective solutions that will allow us to transform our relationship with water. To address increasing water scarcity in many places in the nation, NRDC is working to promote investments and policies that increase water use efficiency and decrease water waste, such as:

- Adopting sensible standards for efficient appliances, buildings, and irrigation;
- Supporting cost-effective investments by utilities to help customers save water; and
- Improving pricing structures to save both water and money.

» *How stormwater runoff solutions can improve efficiency and water quality*

» *Find out how changes in wastewater pricing could save you water and money*

» *Use our interactive tool to see how different California communities are planning for the future*





# The Effects of Environmental Pollution on North American Temperate Forests

Of the 7,936,191 chemicals registered by the American Chemical Council in July 1986, only 6 - less than one in a million - are considered by the EPA in its review and regulation of air quality. One of those six, lead, is not monitored by state air quality management agencies.

©1992 Melissa Kaplan. Available in PDF

## Temperate Forests

Temperate forests are less complex than rain forests, generally being comprised of two layers - the trees and an understory of shrubs. Sunlight penetrates the tree foliage and reaches the ground allowing for the growth of an herbaceous and moss ground layer. Rain is generally spread out over the year and is adequate to support plant growth. In some areas of the world, including Alaska's southeast coast, rain is so plentiful and plant growth so luxuriant that these temperate conifer and deciduous forest areas are referred to as temperate rain forests.

There are several different types of forest, based primarily on the mix of trees found there. The Pacific Northwest is a coniferous forest containing redwood, Western red cedar and hemlock. Hemlock is also found in the Great Lakes coniferous and deciduous region, along with pine, oak, birch and maple. In the eastern states, the broad-leaf deciduous forest includes a variety of oak species as well as beech, ash and chestnut.

Although there are relatively few species of trees in the temperate forest, the forest itself is home to a large variety of woody and herbaceous shrubs and plants, as well as ground, burrowing and arboreal mammals, birds, reptiles and insects (Whitfield, 1989, p. 72).

Coniferous and deciduous temperate forests now cover some 2 billion hectares (20,000,000 sq. km) around the world; of that, 1.1 billion hectares (11,000,000 sq. km) are coniferous forests typically cut for lumber products. 90% of this type of forest lies in the United States, Soviet Union and Scandinavia.

Once covering 180,000 hectares (1,800 sq. km), one of the greatest coniferous forest on earth once ranged from Alaska, down Canada's western coast, through the Pacific Northwest and down into Northern California. While 60% of Canada's forest has been felled, 90% of the United States's forest is gone. Government and timber industry optimists estimate that the remaining 10% will be cut down by the middle of the next century; conservationists predict it will all be gone within the next two decades (Lean, 1990, p. 81). Home to some of the world's largest and oldest trees, most of the remaining forests are on public, government-owned land. Canada has minimal controls and does little to protect its ancient forests. The U.S. has controls and legislation in place, but those laws are suborned by congressional and Forest Service directives pushing timber production (Sierra, 1992, p. 67).

Nutrients are processed and stored in the soil and in plant tissue. Rain, falling through the foliage onto the plants and soil below, carries whatever substances have mingled with the water molecules as well as washes the dry deposits off the leaves and branches. Microorganisms in the soil break down the organic litter and detritus on the forest floor, a process that can take decades before the organic matter is available in molecule form to be taken up by plant roots (Whitfield, 1989, p. 72).

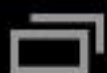
Deforestation has been occurring on the North American continent ever since white settlers hit the eastern shores. Through the past 300 years, forests have been felled to provide agricultural land, timber and lumber products and, more recently, for energy and mineral extraction (Sierra, 1992, p. 67). For the past several decades, however, a new agent has been at work destroying trees, especially those at high elevations seemingly apart from man's habitations and commerce (Whitfield, 1989, p. 72).

Waldsterben (tree death) is one of the more serious effects of acid fallout. Although the natural leaching of soil elements over time leads to the acidification of the soil, the primary source of acidity now comes from the acid precipitation - clouds, fog, rain, snow and hail - and dry deposits (Whitfield, 1989, p. 164).

## Clean Air

Scientists have finally come up with a definition of clean air and precipitation. Unfortunately, no one thought to do this while the air was actually clean. Thus any discussion of clean air is based upon what scientists think the air quality was like before major industries, power plants and vehicular transportation became so common a part of our socioeconomic landscape.

Clean air is generally defined as air found far from, and without the effects of, human habitation and commerce. Comprised of oxygen, nitrogen and rare gases such as argon, neon, helium, ozone, carbon dioxide, krypton, xenon and naturally occurring radioactive materials from the earth, it also has various sulfur and nitrogen compounds. Mixed up with all of these chemicals is water vapor and suspended solid particulates and liquid substances. Known collectively as aerosols, these may be defined as dust particles and nuclei. The latter include chloride salts, sulfuric and nitrous







## Latest News

# 40 US Mines are Causing Water Pollution that Will Last for Centuries, Says New Report

BY DANIEL ADEL – MAY 2, 2013

## Water treatment for these mines could cost as much as \$67 billion per year

In the midst of declining fresh water supplies, an increasing number of hard rock mining companies are causing water pollution that will last for hundreds or thousands of years, says a new report published yesterday.



Photo by Maryland Attorney General/Doug Gansler

An acid drainage from an abandoned coal mine pollutes a creek in Barton, Maryland. Acid mine drainage is the primary cause of lasting pollution of water sources from mining operations.

The **report** by the mining watchdog group **Earthworks**, reveals that an estimated 17 to 27 billion gallons of polluted water will be generated by 40 existing hardrock mines (e.g. gold, copper, uranium mines) in the US each year, every year, in perpetuity. It says water treatment for these mines will cost as much as \$67 billion per year.

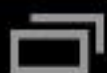
Perpetual management of mines is a rapidly escalating national dilemma as several new mining projects are being planned across the United States. Yet, the enormous and increasing water use at mines has gone almost unnoticed, says the report titled, "Polluting the Future: How Mining Companies are Contaminating Our Nation's Waters in Perpetuity." The report, also reveals that four proposed mines could additionally pollute for perpetuity, another 16 billion gallons of water a year.

"The scale of the problem is enormous, and growing," says Bonnie Gestring, Earthworks northwest organizer and author of the report. "Every year, mines will pollute enough water to fill 2 trillion water bottles — enough bottles to reach to the moon and back 54 times."

The report uses analysis of government data to show, for the first time, the staggering amount of US water supplies that are perpetually polluted by mining. Gestring defines

"in perpetuity" as water pollution that will continue for hundreds or thousands of years, or for which government agencies can't predict a point at which water quality standards will be met without treatment.

"Agriculture, energy development, municipalities and fish and wildlife are already competing for increasingly scarce water resources," says Gestring. "The difference is, when these mines 'use' water, they pollute it forever."



9:15 AM















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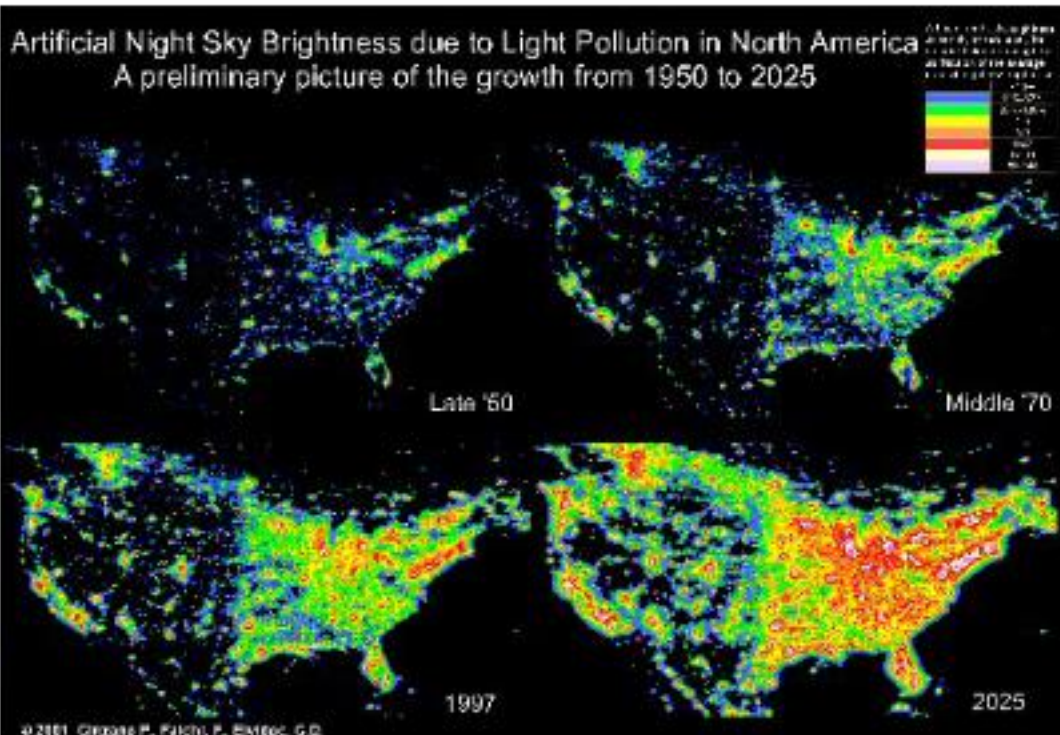
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## Growth of light pollution in USA

Is light pollution killing our birds? - Challenge magazine, Summer 2006.

Pierantonio Cinzano has offered the webmaster this image of light pollution in the USA from 1950 through the present day and extrapolated, tentatively, into the year 2025! Now only ~13 years away! This webmaster lived in Bethlehem, PA in 1982. Lehigh Valley AS had only air traffic pylons as a problem! I guess Bethlehem fire-flies are not best pleased! You will have to live on a Rocky Mountain retreat to see the Milky Way in the near future! Is this future worth it? Did Arnold Schwarzenegger get it right? We will have to see - if we live that long, apparently? Let us hope that the future can fix our frequent failures! If it doesn't then the 24 hour day will just kill off Life On Earth? - Period!



Something needs to be done soon. Light pollution is already a problem NOW in Death Valley National Park, California. Light Pollution from Las Vegas is the cause of the problem. Have a look at this excellent broadband TV programme from California - <http://www.californiaconnected.org/tv/archives/449> By 2025 dark skies will have gone from the lower 48? Two out of every three people cannot see the Milky Way from their homes and 99% live under skies polluted by light. Watch California Connected and learn the truth - which is now 3 years old. We really are running out of time. We really will be JTL?

BTW news today (26 August 2009) that Death Valley gets to 120 degs Fahrenheit 6 days sooner than it did way back in 1913. When will people realise that global warming is a REAL harsh reality and not a mere THEORY?

Image courtesy of CINZANO P. (2002). The growth of the artificial night sky brightness in North America in the period 1947-2000: a preliminary picture. In H. SCHWARZ ED. Light Pollution: a Global View. (pp. 39-48). DORDRECHT: Kluwer.

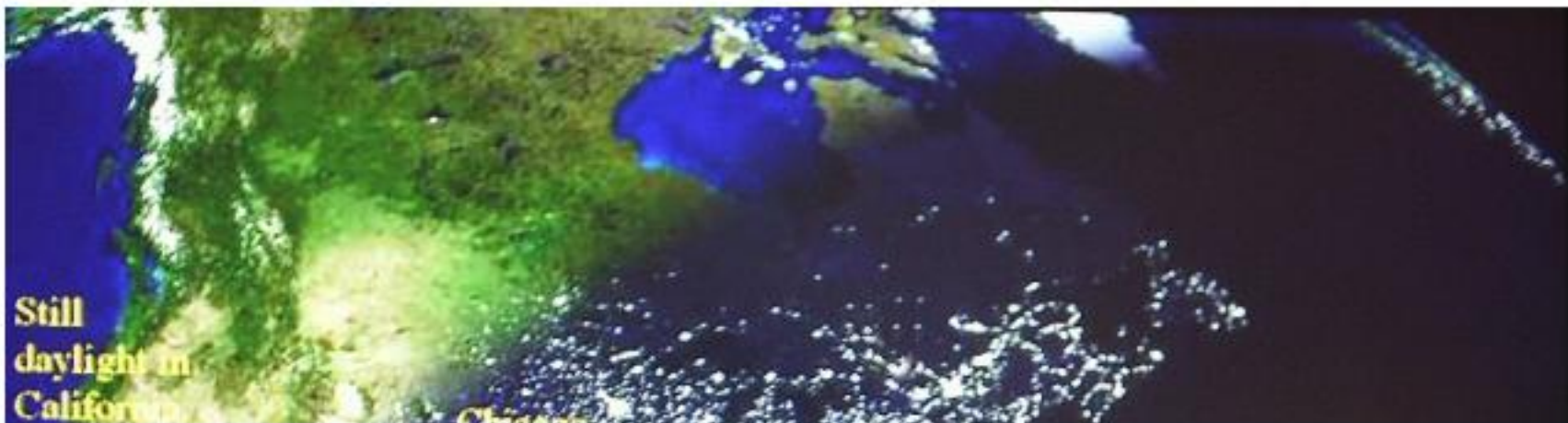
A larger picture can be seen at - <http://www.yosemite.org/naturenotes/NALightPollution>

Dr. Pierantonio Cinzano has provided the web managers with his new web site. You can access this at - [www.savethenight.eu](http://www.savethenight.eu)

FOOD FOR THOUGHT? You have heard of the IUCN Red List - Did you know that the IUCN now has a Dark Sky Advisory Group? It seems that they have at last agreed with my "coincidental" observation from last year (2008)? Don't forget that Life On Earth doesn't have a reset button. Once gone species do not come back. In spite of Jurassic Park, dinosaurs have not returned.

BTW were you aware that whip-poor-wills in upper New York state are in decline? A friend of the webmaster has reported that in 1983 there were over 200 pairs near where he lives. The last count in 2007 there were only about 7 pairs. In 2009 he hadn't heard any! Sad huh? Clearly whip-poor-wills will soon stop singing because there are none - there is no longer the night in which they once sang? Read more here - Mass Audubon Whip-poor-will Project Maps The maps show locations in Massachusetts where Whip-poor-wills have been reported via various surveys in the past 70 years. I detect a reduction in numbers - what do you think?

- Reports (1937 - 1960)
- Breeding Bird Atlas 1 (1974-1979)
- Breeding Bird Atlas 2 (Year One - 2007)







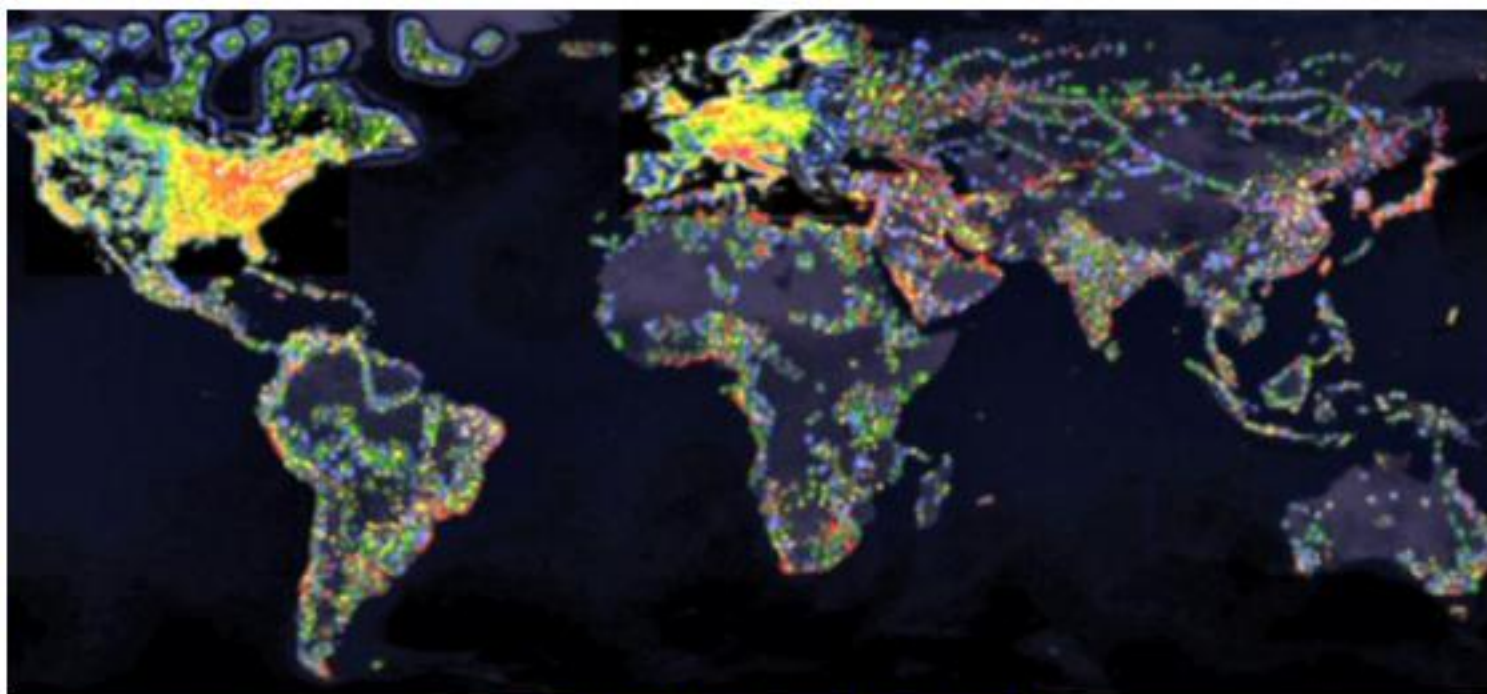
### From A Round Robin PPS Slide Show Just Received

A friend has just sent me (Monday 4th February 2008) a PPS slide show which included this image. Once the sun sets in the USA the lights go on everywhere. The 24 hour day, which is "killing off" Life On Earth?

Sad but apparently true.

### What you can look forward to

The image on the right is adapted from a [NASA page](#) showing an image of the Earth from space at night. A better version by Cinzano, Falchi and Elvidge can be found [HERE](#). Now that we



"enjoy" the 24 hour day can we perhaps ask the question "Is the 24 hour day killing off Life On Earth?" The original NASA composite image was created in about the year 2000 but was made up from images gathered over a 9 month period during 1994 and 1995. Of course exactly half the world will be in daylight at any one time and so that original image is an artist's impression of what the whole Earth would look like if the Sun was switched off. The image at the right is a composite using the 2025 images of the USA and Italy, with Europe from 2000, and the rest of the world's lights at night "artistically" imagined to be nearly as bad as the USA and Italy will be in 2025. What do you think of this future world wide 24 hour day? For me it means Bye-Bye Whip-poor-wills, Bye-Bye!

NASA has a light pollution LP page at [http://science.nasa.gov/headlines/y2001/ast01nov\\_1.htm](http://science.nasa.gov/headlines/y2001/ast01nov_1.htm)

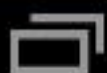
Would you like to listen to people on CBC talk about seeing the stars during their recent blackout?

Anna Maria Tremonti hosted a CBC radio broadcast about "Too Much Light"!

This was October 1, 2003.

If you learnt anything from the video above, then listen to this. You can fill in the emotions which are expressed with your imagination. You do not need much imagination to do this but the emotions created are spectacular.

The page is here -







# National Pollution Funds Center

*Funding Today for a Cleaner Tomorrow*

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For up-to-date information regarding Gulf Coast Restoration Efforts, please visit:  
The Unified Commands Restore the Gulf website at  
[www.restorethegulf.gov](http://www.restorethegulf.gov)

The Deepwater Horizon Claims Center is accepting claims from private individuals and businesses for the Gulf Coast oil spill pursuant to the Court Supervised Settlement Process. Information about the Court Supervised Settlement Process can be found at:  
<http://www.deepwaterhorizonsettlements.com/> or by contacting (866) 992-6174.

## Liability Limits Report

The 2012 Annual Report on [OPA Liability Limits](#)

The U.S. Coast Guard's National Pollution Funds Center (NPFC) was created to implement Title I of the [Oil Pollution Act \(OPA\)](#), which addressed issues associated with preventing, responding to, and paying for oil pollution. Title I of OPA established oil spill liability and compensation requirements, including the [Oil Spill Liability Trust Fund \(OSLTF\)](#) to pay for expeditious oil removal and uncompensated damages.<< For more information, visit [About NPFC](#) >>



9:22 AM











Google ...



/2010/09/google-map-of-us-light-pollution.html



# Google Maps Mania

Google Maps Mania is an unofficial Google Maps blog tracking the websites, mashups and tools being influenced

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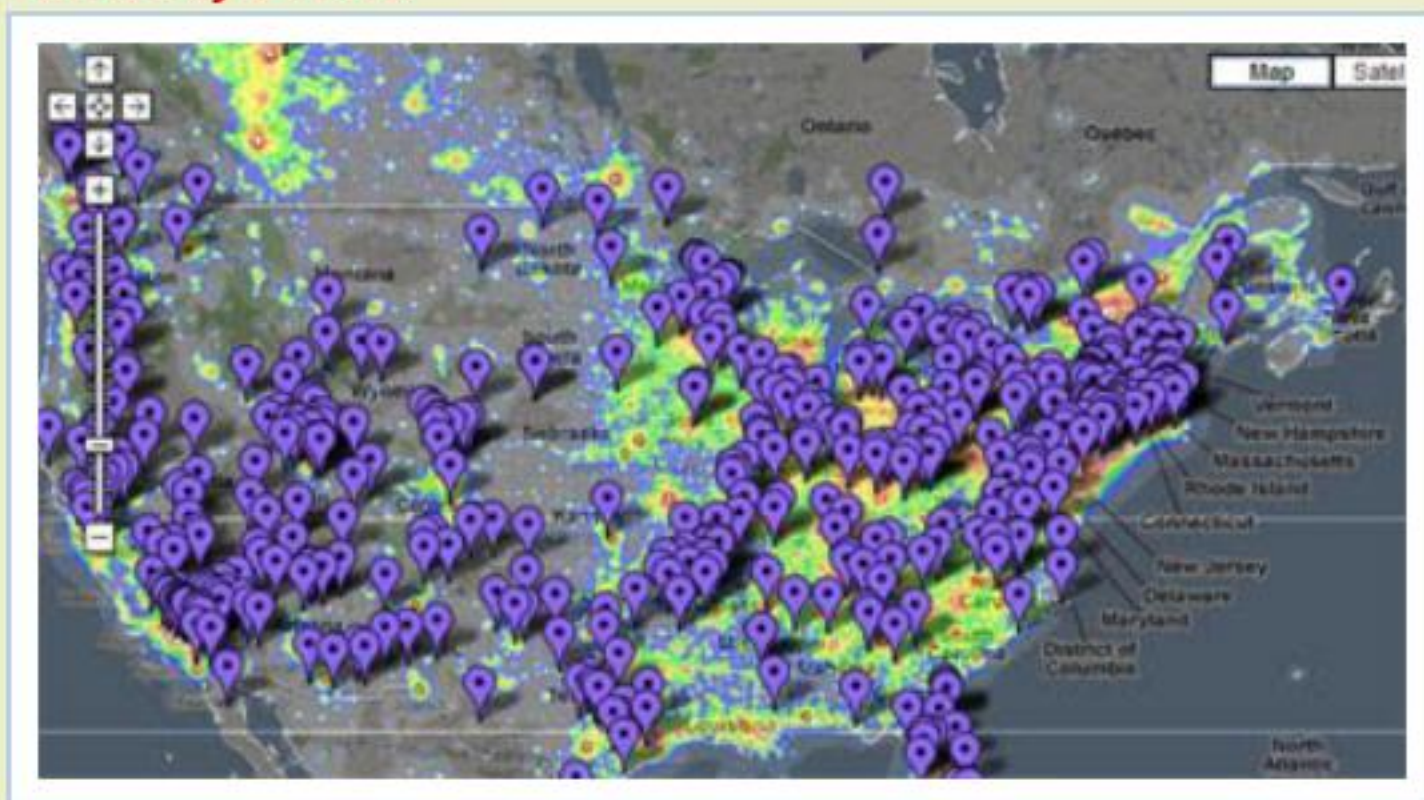
[Map Locations](#)

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Monday, September 13, 2010

## Google Map of US Light Pollution

### Dark Sky Finder



The Dark Sky Finder shows the effects of light pollution in the United States. The map also displays user submitted sites which are good locations for setting up telescopes.

Light pollution is shown on the map via a heat map overlay. User submitted sites are displayed with simple map markers. If you click on a map marker you can view details about the submitted site beneath the map.

Users can set the light pollution layer to on or off. Users can also add their own astronomy locations to the map by completing a short form. If you find a great location on the map and you want to share it with others you can get a URL to the map by choosing 'link to this view'.

### Also See

**Daylight Map** - Map of current current day and night time in the world. Also shows the effects of light pollution around the world.

Posted by Keir Clarke at 12:24 PM

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Labels: [Google Sky](#), [USA](#)



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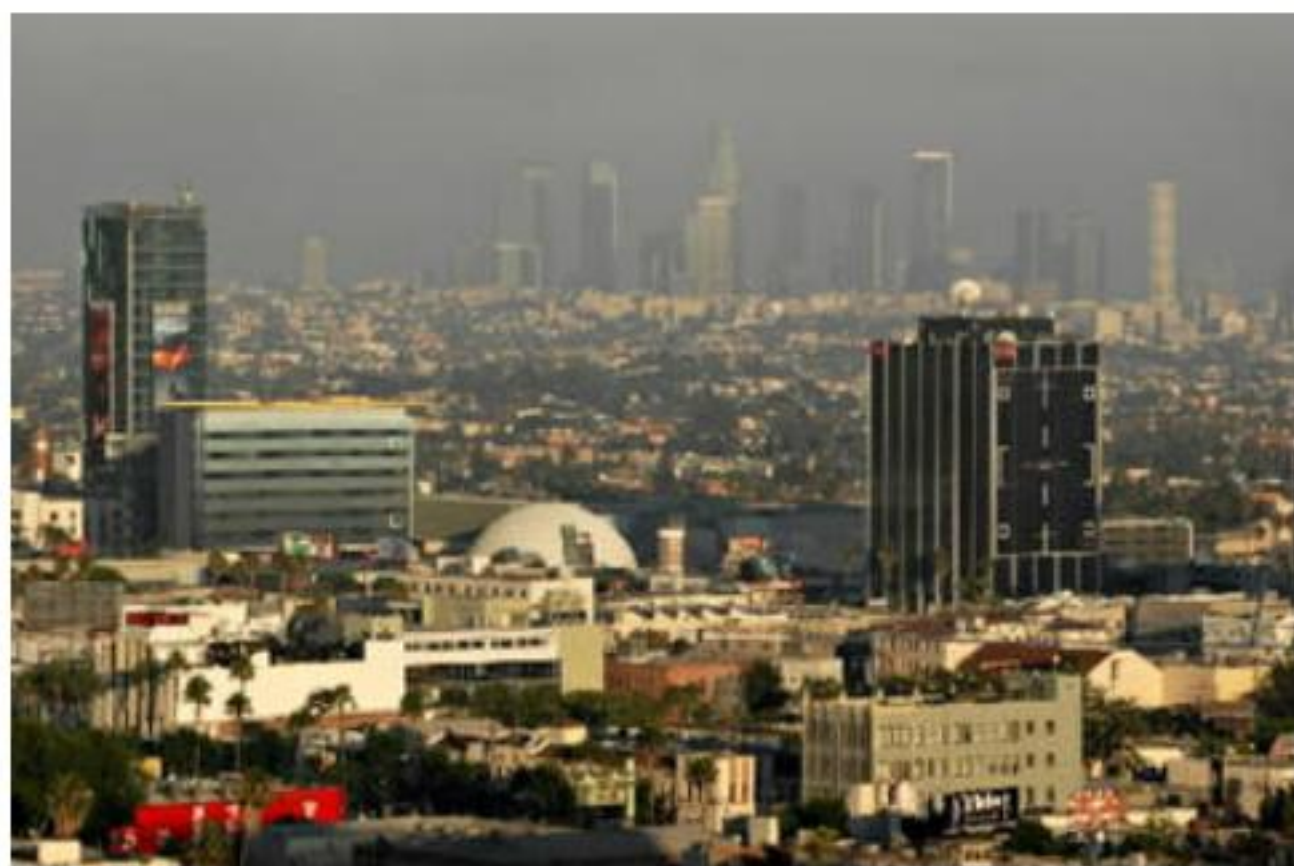


## Progress Watch

# US air pollution hits 10-year low, report finds

A report by the American Lung Association finds that air pollution has fallen to its lowest levels since the group began collecting data in 2000. The ALA credits the Clean Air Act.

By Andrew Mach, Contributor / April 25, 2012



An view of Hollywood with downtown Los Angeles in the background, as seen from the slopes of Mount Hollywood. Pollution and smog cloud the view.

Mary Knox Merrill / The Christian Science Monitor

+ Enlarge



American cities with the dirtiest air have reached a new milestone in efforts to clean up their act.



+ Enlarge



In Pictures: **Some of the world's most polluted cities**

The air quality in the [US](#) is at its highest level in a decade, according to a new report released by the [American Lung Association](#) (ALA) Wednesday. The nonprofit organization credits the trend to tougher environmental standards set for smog and soot in the air.

"We're making real and steady progress in cutting dangerous pollution from the air we breathe," said Charles Connor, American Lung Association president and CEO, in the organization's State of the Air press





## SPECIAL ARTICLE

## Fine-Particulate Air Pollution and Life Expectancy in the United States

C. Arden Pope, III, Ph.D., Majid Ezzati, Ph.D., and Douglas W. Dockery, Sc.D.

N Engl J Med 2009; 360:376-386 | [January 22, 2009](#) | DOI: 10.1056/NEJMsa0805646

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## BACKGROUND

Exposure to fine-particulate air pollution has been associated with increased morbidity and mortality, suggesting that sustained reductions in pollution exposure should result in improved life expectancy. This study directly evaluated the changes in life expectancy associated with differential changes in fine particulate air pollution that occurred in the United States during the 1980s and 1990s.

[Full Text of Background...](#)

## METHODS

We compiled data on life expectancy, socioeconomic status, and demographic characteristics for 211 county units in the 51 U.S. metropolitan areas with matching data on fine-particulate air pollution for the late 1970s and early 1980s and the late 1990s and early 2000s. Regression models were used to estimate the association between reductions in pollution and changes in life expectancy, with adjustment for changes in socioeconomic and demographic variables and in proxy indicators for the prevalence of cigarette smoking.

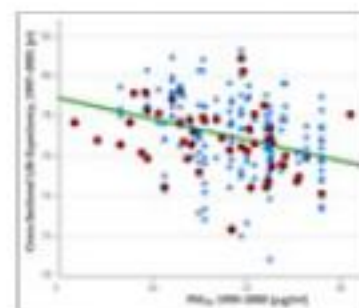
[Full Text of Methods...](#)

## RESULTS

A decrease of 10  $\mu\text{g}$  per cubic meter in the concentration of fine particulate matter was associated with an estimated increase in mean ( $\pm\text{SE}$ ) life expectancy of  $0.61 \pm 0.20$  year ( $P=0.004$ ). The estimated effect of reduced exposure to pollution on life expectancy was not highly sensitive to adjustment for changes in socioeconomic, demographic, or proxy variables for the prevalence of smoking or to the restriction of observations to relatively large counties. Reductions in air pollution accounted for as much as 15% of the overall increase in life expectancy in the study areas.

## MEDIA IN THIS ARTICLE

Interactive Graphic



Life Expectancies in 51 Metropolitan Areas in the United States, 1978–1982 and 1997–2001, and Changes in Life Expectancy, 1980s–1990s.

## FIGURE 1



Distribution of Study Areas.

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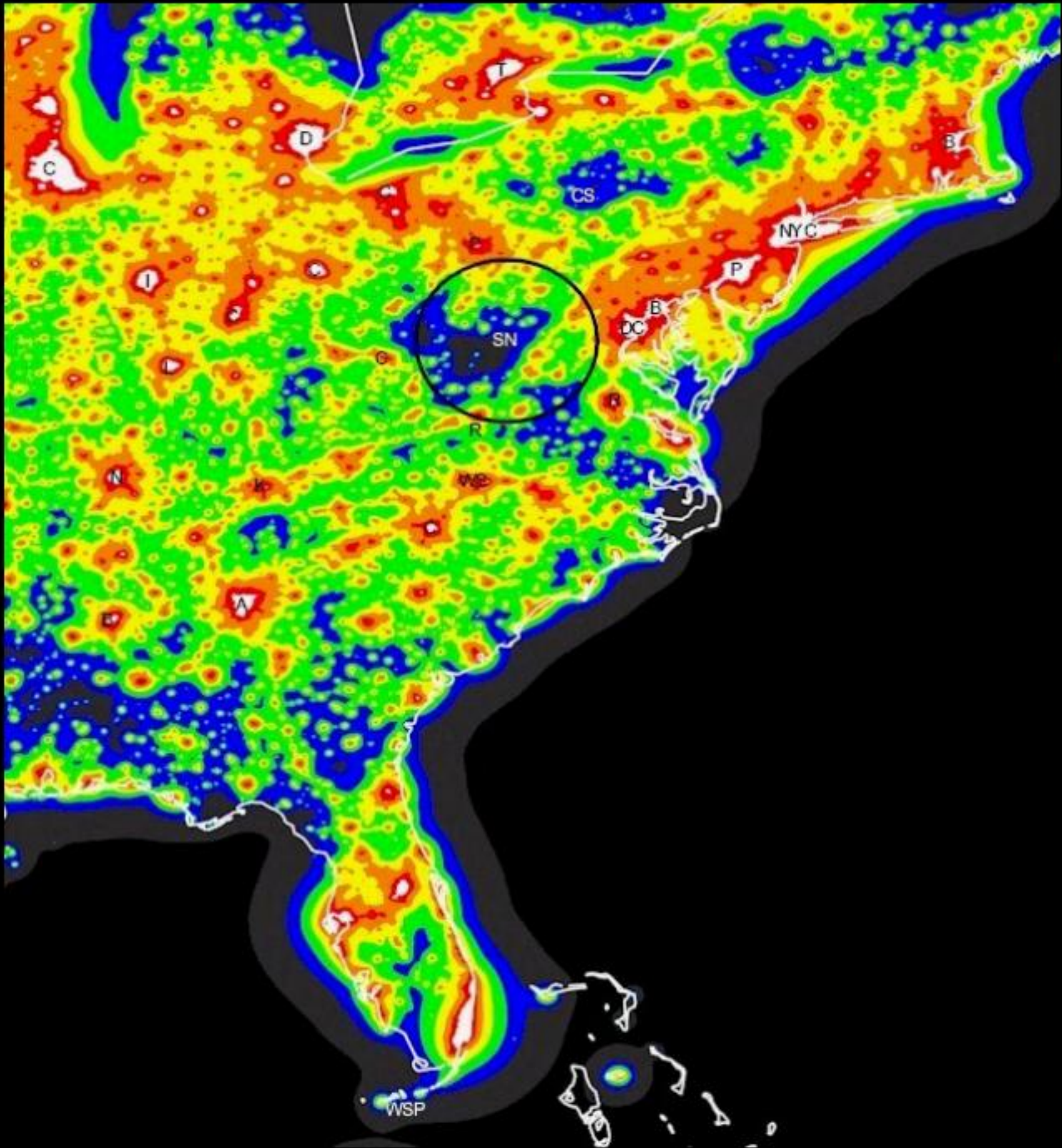






## Light Pollution Map of the Eastern USA

This light pollution map shows the amount of light pollution on the eastern half of the United States. The darker areas on the map have less light pollution. As you can see [Spruce Knob State Park \(SN\)](#) is in one of the darkest areas east of the Mississippi. It is a great place for observing. Another good location is Cherry Spring State Park (CS). The [Black Forest Star Party](#) is a very popular [star party](#) held at [Cherry Springs](#).



The dark in this light pollution map areas are the best place to view the stars, milky way, and deep space objects.

[Click here for a light pollution map of the eastern PA, NJ, and NY](#)

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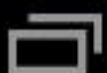
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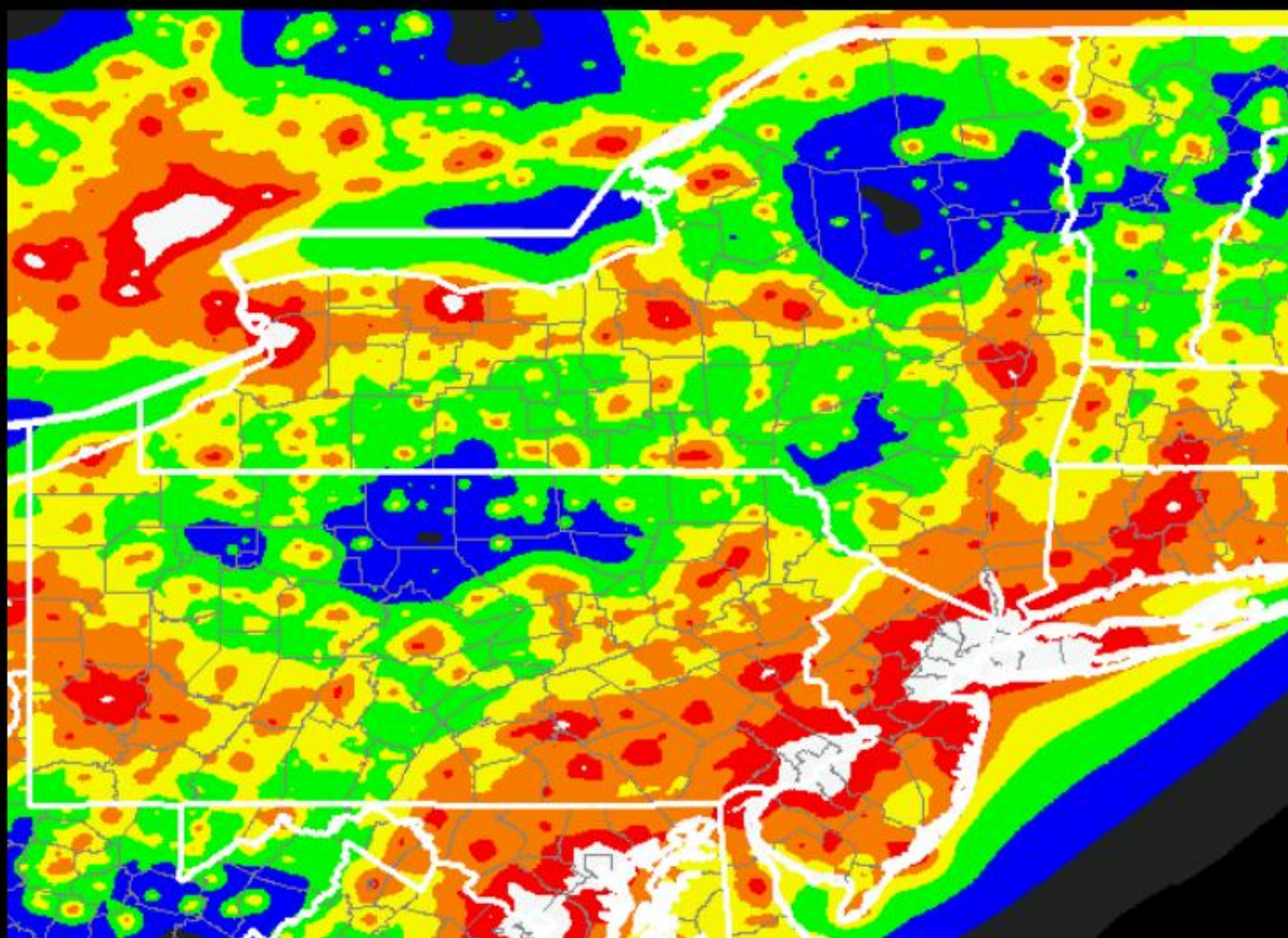
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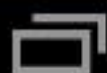
## Light Pollution Map of PA, NJ, and NY



Forrest Hamilton of the Maryland section of the International Dark Sky Association (IDA) has taken the time to divide the [The World Light Pollution Atlas](#) into states and added county lines.

Photo copyright: [Light Pollution Science and Technology Institute](#)

[Light Pollution at NOAA](#)



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### Smog Towns, U.S.A.

While air in the U.S. is cleaner than it was 10 years ago, about half of us are risking our health by inhaling pollution. One of the biggest dangers is from ozone -- a gas that worsens asthma and COPD and can even shorten your life. So what cities have the worst air? Here's a rundown of the 10 dirtiest cities from the American Lung Association's "State of the Air 2013" Report -- along with a few of the cleanest.

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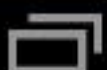
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This hot, dry city sits on the U.S.-Mexico border and has to deal with ozone from both sides. Pollution blows north from Mexicali, a nearby Mexican city. And burning farm waste and traffic from clogged border crossings worsen the problem. Why is smog often worse in hot climates like El Centro? Ozone smog forms when pollutants -- from factories and cars -- interact with heat and sunlight.

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No. 3: Bakersfield, Calif.

This Southern California city of about 350,000 is No. 1 for both year-round and short-term spikes in particle pollution (soot). These tiny bits of solids and liquids can lodge deep in your lungs and raise the risk of heart disease, stroke, and asthma attacks.

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### No. 2: Visalia, Calif.

This small farm town, a gateway to Sequoia National Park, is plagued by pollution trapped against the nearby Sierra Nevada mountains. Lots of sunshine plays a role. So does dirty exhaust from diesel trucks, busses, and other vehicles, which causes 80% of the valley's smog.

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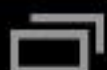
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- Read Schindler's letter to the ministers (pdf)
- Gulf Seafood Deformities Alarm Scientists

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"I propose that the ELA site and laboratory should be kept open to conduct these important experiments, which have implications for future effects of oil extraction and transport in or near both marine and freshwater ecosystems," Schindler wrote in a letter to Environment Minister Peter Kent and Fisheries Minister Keith Ashfield.

The ELA was shuttered on March 31 after its funding was cut in last year's budget. The Department of Fisheries and Oceans (DFO) says it is in negotiations with other parties to take over the operation of the one-of-a-kind facility. The government will save \$2-million a year by off-loading the outdoor laboratory made up of 58 small pristine lakes.

Schindler cited a number of studies that looked into the effects of oil and chemical contamination on fish after the Exxon Valdez spill in Alaska and the Deepwater Horizon accident in the Gulf of Mexico, as well as in the lower Athabasca River. He included photos of fish from the Athabasca with two tails, bulging eyeballs and gaping sores.

"In both the Gulf of Mexico and the Athabasca River, the high incidence of malformations and the grotesque appearance of some of the fish make consumers reluctant to eat them," wrote Schindler. He added that was a threat to the Gulf of Mexico's commercial fishery and the Athabasca's subsistence fishery.



A Walleye with an enlarged eye caught near Ft. McKay, Alberta, on the Athabasca River in 2010. (David Schindler/University of Alberta)

Schindler's "eureka moment" came last week when he was forwarded an article about a study done on fish in the Gulf of Mexico.

"I was really struck with how similar some of those malformations were. And of course, they'd come on in only a little over a year since that Gulf spill," Schindler told the CBC.

The timing of the letter is hard to ignore. It comes hard on the heels of the ELA's closure with a September 1 deadline looming for Ottawa to find a new operator or return the property to the province of Ontario. Schindler is a vocal member of the advocacy group "Save ELA."

Asked if this was just a ploy to keep the facility open, Schindler responded: "That's exactly what they said when I proposed that acid rain was a problem in 1974."

Research from the ELA was instrumental in helping Canada and the U.S. negotiate, draft and sign the Acid Rain Treaty of 1991.

For Ottawa's part, Environment Canada insisted it is taking its responsibilities around the oil sands seriously.

"Our government launched a comprehensive oil sands monitoring plan that enhances the monitoring of water, air, land and biodiversity," Kent spokesperson Rob Taylor wrote to the CBC.

DFO said it is happy with the freshwater science being done at other facilities across the country.

"On the Experimental Lakes Area, the government continues to actively work towards establishing a new operator for the ELA site so that research there can continue," wrote Ashfield spokesperson Erin Filliter.

Schindler is glad to hear that.

"Frankly, I would like to see the Experimental Lakes Area funded independently of DFO. It's always been a Cinderella project and for 30 years DFO has been a very bad stepmother."



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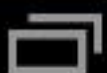
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[Gulf Seafood Deformities Alarm Scientists](#)

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A renowned Alberta water scientist is urging the federal government to take action after he discovered deformities in fish in the Athabasca River downriver from oil sands developments bear a striking resemblance to ones found in fish after spills in U.S. waters.

University of Alberta ecologist Dr. David Schindler said the only way to know for sure which petrochemicals — and in what concentrations — cause the deformities is to conduct whole ecosystem experiments at the Experimental Lakes Area (ELA) in Northern Ontario.

"I propose that the ELA site and laboratory should be kept open to conduct these important experiments, which have implications for future effects of oil extraction and transport in or near both marine and freshwater ecosystems," Schindler wrote in a letter to Environment Minister Peter Kent and Fisheries Minister Keith Ashfield.

The ELA was shuttered on March 31 after its funding was cut in last year's budget. The Department of Fisheries and Oceans (DFO) says it is in negotiations with other parties to take over the operation of the one-of-a-kind facility. The government will save \$2-million a year by off-loading the outdoor laboratory made up of 58 small pristine lakes.

Schindler cited a number of studies that looked into the effects of oil and chemical contamination on fish after the Exxon Valdez spill in Alaska and the Deepwater Horizon accident in the Gulf of Mexico, as well as in the lower Athabasca River. He included photos of fish from the Athabasca with two tails, bulging eyeballs and gaping sores.

"In both the Gulf of Mexico and the Athabasca River, the high incidence of malformations and the grotesque appearance of some of the fish make consumers reluctant to eat them," wrote Schindler. He added that was a threat to the Gulf of Mexico's commercial fishery and the Athabasca's subsistence fishery.



A Walleye with an enlarged eye caught near Ft. McKay, Alberta, on the Athabasca River in 2010. (David Schindler/University of Alberta)

Schindler's "eureka moment" came last week when he was forwarded an article about a study done on fish in the Gulf of Mexico.

"I was really struck with how similar some of those malformations were. And of course, they'd come on in only a little over a year since that Gulf spill," Schindler told the CBC.

The timing of the letter is hard to ignore. It comes hard on the heels of the ELA's closure with a September 1 deadline looming for Ottawa to find a new operator or return the property to the province of Ontario. Schindler is a vocal member of the advocacy group "Save ELA."



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## Industrial Carbon Pollution Standards

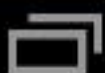
### President Obama's Climate Change Action Plan

On Tuesday, June 25, 2013 in Washington, D.C., President Obama announced his [Climate Action Plan](#). The plan, divided into three themes, outlines steps to cut carbon pollution in the United States including standards for both new and existing power plants, steps to prepare the US for the impacts of climate change, and plans to lead international efforts to address global climate change.

**Below is a compilation of reactions and resources related to the announcement:**

#### Press Releases

- [Clean Water Action Backs President's Call for Action on Climate](#), Clean Water Action Press Statement, 6.25.13
- [Statement from Maura Cowley, Executive Director, Energy Action Coalition on President Obama's Climate Address](#), Energy Action Coalition Press Statement, 6.25.13
- [Winter Sports Community Optimistic After Obama Climate Statement Today](#), Protect Our Winters Press Statement, 6.25.13
- [President Obama Pledges To Help Communities Prepare for Climate Change, Reduce U.S. Emissions](#), Union of Concerned Scientists Press Statement, 6.25.13
- [Obama Shares More Details on Climate Plans](#), Union of Concerned Scientists Press Statement, 6.25.13
- [Public Lands and Renewable Energy Will Play a Critical Role in Obama's Plan to Fight Climate Change](#), The Wilderness Society Press Statement, 6.25.13
- [Labor, Environmental & Conservation Leaders Applaud President's Climate Change Plan](#), BlueGreen Alliance Press Statement, 6.25.13
- [Obama's Climate Action Plan Welcomed in the South](#), Southern Alliance for Clean Energy Press Release, 6.25.13
- [Statement from Carroll Muffett, President & CEO of Center for International Environmental Law \(CIEL\) on President Obama's Climate Action Plan](#), Center for International Environmental Law (CIEL) Press Statement, 6.25.13
- [Obama's Climate Change Speech Kick Starts Needed Action to Address "Acute Risk to Human Well-Being," Says The Nature Conservancy CEO](#), Press Statement, 6.25.13
- [Sierra Club Statement on President Obama's Climate Plan](#), Sierra Club Press Statement, 6.25.13
- [Obama: "We Can't Just Drill Our Way Out of the Energy and Climate Challenge."](#) Oil Change International Press Statement, 6.25.13
- [President Obama to Announce Action on Climate Change](#), World Resources Institute Press Statement, 6.25.13
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- [Obama Climate Plan a Key Milestone on Path to Secure Climate Future](#), National Wildlife Federation, Press Statement 6.25.13
- [Obama Climate Change Plan Addresses Latino Concerns \(English and Spanish Release\)](#), Voces Verdes Press Release, 6.25.13
- [Statement of EDF President Fred Krupp On the Announcement of the President's Climate Action Plan – June 25, 2013](#), Environmental Defense Fund Press Release, 6.25.13
- [Joint Center President, Commission Applaud President Obama's Climate Change Plan](#), Joint Center for Political and Economic Studies Press Release, 6.25.13
- [Earthjustice on President Obama's Climate Change Address at Georgetown University](#), Earthjustice Press Release, 6.25.13
- [Obama Climate Plan Not Enough to Meet Magnitude of Global Crisis](#), Center for Biological Diversity Press Release, 6.25.13
- [Statement of Conservation Law Foundation In Response to President Obama's Climate Action Plan Announced Today](#), Conservation Law Foundation (CLF) Press Statement, 6.25.13
- [League of Conservation Voters on President Obama's Landmark Climate Change Speech](#), League of Conservation Voters Press Statement, 6.25.13
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- [ICLEI USA Statement on President Obama's Climate Action Plan](#), ICLEI-Local Governments for Sustainability Press Statement, 6.25.13
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Along with amazing technological advances, the Industrial Revolution of the mid-19th century introduced new sources of air and water pollution. By the middle of the 20th century, the effects of these changes were beginning to be felt in countries around the world. In the 1960s, an environmental movement began to emerge that sought to stem the tide of pollutants flowing into the planet's ecosystems. Out of this movement came events like Earth Day, and legislative victories like the Clean Air Act (1970) and the Clean Water Act (1972).

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By the late 18th century and first part of the 19th century, coal came into large-scale use during the Industrial Revolution. The resulting smog and soot had serious health impacts on the residents of growing urban centers. In 1952, pollutants from factories and home fireplaces

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In the latter part of the 13th century, in an effort to reduce air pollution, England's King Edward I threatened Londoners with harsh penalties if they didn't stop burning sea-coal. However, the king's regulations—and those of subsequent leaders—had little effect.

By the late 18th century and first part of the 19th century, coal came into large-scale use during the [Industrial Revolution](#). The resulting smog and soot had serious health impacts on the residents of growing urban centers. In 1952, pollutants from factories and home fireplaces mixed with air condensation killed at least 4,000 people in London over the course of several days. A few years earlier, in 1948, severe industrial air pollution created a deadly smog that asphyxiated 20 people in Donora, [Pennsylvania](#), and made 7,000 more sick. Acid rain, first discovered in the 1850s, was another problem resulting from coal-powered plants. The release of human-produced sulfur and nitrogen compounds into the atmosphere negatively impacted plants, fish, soil, forests and some building materials.

Today, the leading cause of air pollution in the U.S. is motor vehicles, which were first mass-produced in the U.S. by [Henry Ford](#) in the early 20th century. Auto emissions also increase the amount of greenhouse gases in the atmosphere, which in turn contribute to global warming.

In 1963, in an effort to reduce air pollution, the U.S. Congress passed the Clean Air Act, legislation which has been amended and strengthened in the ensuing decades. However, in 2007, almost half (46 percent) of all Americans resided in counties with unhealthy levels of either ozone or particle pollution, according to the American Lung Association (ALA). Ozone, or smog, is described by the ALA as "an irritating, invisible gas that is formed most often by a reaction of sunlight and vapors emitted when fuel is burned by cars and trucks, factories, power plants and other sources. Ozone reacts chemically ("oxidizes") with internal body tissues that it comes in contact with, such as those in the lung." It irritates the respiratory tract and can lead to a number of health problems, including asthma attacks, chest pain and even death. The ALA defines particle pollution (formerly referred to as soot) as "the most dangerous, and deadly, of the widespread outdoor air pollutants." Particle pollution is microscopic and derived from "a complex mixture that can include ash, soot, diesel exhaust, chemicals, metals, and aerosols. In the eastern U.S., many particles come from power plants that burn coal to produce electricity. In the western U.S., many come from diesel buses, trucks, and heavy equipment, as well as agriculture and wood burning," according to the ALA. "Breathing particle pollution year-round can shorten life by one to three years. It causes many other health effects, premature births to serious respiratory disorders, even when the particle levels are very low. It makes asthma worse and causes wheezing, coughing and respiratory irritation in anyone with sensitive airways. It also triggers heart attacks, strokes, irregular heartbeat, and premature death."

Just like air, water is under assault from numerous types of pollution. For centuries, humans unknowingly contaminated sources of drinking water with raw sewage, which led to diseases such as cholera and typhoid. According to a CNN report, one gram of human excrement contains approximately "10 million viruses, 1 million bacteria, 1,000 parasite cysts and 100 parasite eggs." Today, over 1 billion people worldwide lack access to safe water and every 15 seconds somewhere on the planet, a child dies from a water-related disease, according to WaterPartners International ([www.water.org](http://www.water.org)) .

Water pollution intensified with the advent of the Industrial Revolution, when factories began releasing pollutants directly into rivers and streams. In 1969, chemical waste released into [Ohio's](#) Cuyahoga River caused it to burst into flames and the waterway became a symbol of how industrial pollution was destroying America's natural resources. In 2007, CNN reported that "up to 500 million tons of heavy metals, solvents and toxic sludge slip into the global water supply every year. In the developing world [according to UNESCO] as much as 70 percent of industrial waste is just dumped untreated into the rivers and lakes. China is a perfect case in point. According to Greenpeace, around 70 percent of China's lakes and rivers are now polluted from industrial waste, leaving 300 million people 'forced to rely on polluted water supplies.'" Water sources are also contaminated by rain runoff from such things as oil-slick roads; construction, mining and dump sites; and livestock wastes from farm operations. Leaky septic tanks, pesticides and fertilizers are among the other sources that can contaminate groundwater. Over half the American population (including the majority of those living in rural areas) relies on groundwater for drinking water, according to The Groundwater Foundation ([www.groundwater.org](http://www.groundwater.org)), which also notes that the largest use for groundwater is crop irrigation.

In 1972, Congress passed the Clean Water Act to reduce water pollution. Various pieces of anti-pollution legislation have followed since that time and today the U.S. has relatively clean, safe drinking water compared with much of the

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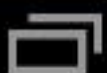
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In 1972, Congress passed the Clean Water Act to reduce water pollution. Various pieces of anti-pollution legislation have followed since that time and today the U.S. has relatively clean, safe drinking water compared with much of the world. However, water pollution is still a problem. In 2006, the Environmental News Service (ENS) reported that "more than 62 percent of industrial and municipal facilities across the country discharged more pollution into U.S. waterways than their Clean Water Act permits allowed between July 2003 and December 2004." The ENS also noted that over 40 percent of American waterways were unsafe for swimming and fishing. Additionally, water resources face an ongoing threat from man-made environmental disasters such as the 1989 Exxon Valdez oil spill, during which approximately 11 million gallons of crude oil were accidentally dumped into the sea off [Alaska's](#) Prince William Sound. The disaster, which created a 3,000-square-mile oil slick, instantly killed hundreds of thousands of birds, fish and other wildlife and devastated the area for years afterward.

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## Questions About Indoor Air Quality?



### Clemson University Cooperative Extension Service

South Carolinians want their homes to be free from indoor air pollutants and toxic substances that can affect the health of children and other family members. You spend 80 to 90 percent of your time indoors, and you may have family members with health conditions which are affected by pollutants.

While pollutant levels from a single source may not be a health risk, some homes have many sources which contribute to indoor air pollution. Fortunately, there are ways to control or eliminate most pollutants at a relatively low cost. These control measures will help you to achieve a healthy house.

This publication answers common questions about indoor air pollutants and discusses ways to reduce or eliminate the problems. For additional information about radon, contact the Clemson University Housing Institute or your County Extension Office for copies of "A Citizen's Guide to Radon," "How to Reduce Radon Levels in Your Home," and "Home Buyers and Sellers Guide to Radon."

### What causes indoor air pollution problems?

Indoor air pollution results when man-made and natural chemicals, gases, particles, and other substances are produced or released in or near the home. Common pollutants found in homes are volatile organic compounds, formaldehyde, particulates, radon, asbestos, and combustion gases and by-products.

These pollutants come from a variety of sources such as household cleaning products, wood or fuels that are burned, building materials and products, furnishings, paint strippers, pesticides, the soil under a house, and human activities.

Some sources, like air fresheners, release pollutants almost continuously. Others, like unvented space heaters, produce pollutants occasionally or when they are used.

### Has anyone set acceptable pollution levels for the home?

Pollution standards exist for outside air and for the work place, but there are no standards for pollutant levels in the home. However, when homes have been monitored, pollutant levels indoors have sometimes exceeded "safe" outdoor or work levels.

An "acceptable" pollution level in your home may depend on such varied factors as:

- whether or not family members have chronic illnesses - especially respiratory or illnesses aggravated by pollutants
- whether there are children or elderly family members who may be more sensitive to pollutant effects
- whether products or materials used in the home produce pollutants and how often they are used
- the effectiveness of your home ventilation system and the distribution of air throughout the house

### How do indoor pollutants affect the health of my family?

You may feel the effects of exposure to an indoor pollutant immediately after exposure, or the problem may not show up until years later. Immediate effects include irritation of the eyes, nose, and throat; headaches; dizziness and fatigue. Age, preexisting conditions, and sensitivity to the pollutant can all affect whether a person reacts to a pollutant.

Other health effects may show up years after exposure or after repeated or long exposure. These effects can include central nervous system damage, chromosomal damage, and cancer. Health effects associated with some indoor air pollutants are summarized in following table.

Table I: Common Indoor Air Pollutants, Sources, Health Impacts, Controls and Detection

Pollutant	Sources	Health Impacts	Controls*	Detection
<b>Asbestos</b>	Insulation on pipes and ducts, wood stove gaskets, ceiling tiles, resilient flooring and tiles, thermal insulation; deteriorating, damaged or disturbed insulation,	Lung cancer, asbestosis, mesothelioma	Do not disturb existing asbestos containing materials; for asbestos-containing materials that are friable (flaking or crumbling), coat with a sealant, enclose with airtight structure or have removed by a professional	Bulk sample sent to lab for analysis; contact your county Extension office or DHEC for a list of laboratories; air sample taken by industrial hygienist using special equipment.



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<b>Asbestos</b>	Insulation on pipes and ducts, wood stove gaskets, ceiling tiles, resilient flooring and tiles, thermal insulation; deteriorating, damaged or disturbed insulation, fireproofing, or acoustical material	Lung cancer, asbestosis, mesothelioma	Do not disturb existing asbestos containing materials; for asbestos-containing materials that are friable (flaking or crumbling), coat with a sealant, enclose with airtight structure or have removed by a professional asbestos abatement contractor.	Bulk sample sent to lab for analysis: contact your county Extension office or DHEC for a list of laboratories; air sample taken by industrial hygienist using special equipment.
<b>Biological contaminants</b>	Molds, mildews, fungi, bacteria, viruses, dust mites; wet or moist walls, ceilings, carpets and furniture; poorly maintained humidifiers, dehumidifiers, and air conditioning; bedding, household pets	Allergies, respiratory irritation, infectious diseases; eye, nose and throat irritations; fever; humidifier fever; influenza	Control relative humidity in house; ventilation and use of outside vented exhaust fans; if humidifiers are used, clean reservoir daily with chlorine bleach or disinfectant, or follow manufacturer's instructions for cleaning; seal ductwork, especially those located in crawl spaces.	Air sample taken by industrial hygienist using special equipment; odor of mold and mildew; relative humidity can be checked with sling psychrometer or humidity sensor.
<b>Combustion Products</b>	Unvented space heaters (natural gas, kerosene, fuel oil, and charcoal), unvented gas stoves, wood stoves and fireplaces; tobacco smoke; human respiration; outside air	Headaches, drowsiness, dizziness (carbon dioxide); impairment of vision and brain functioning, irregular heart functioning, nausea, mental confusion, death (carbon monoxide); respiratory distress and lung damage (nitrogen dioxide)	Supply adequate combustion air for appliances, especially by use of outside air for combustion; have gas or oil furnaces and exhaust systems checked annually; use exhaust fans vented to outside; use catalytic converters on wood burning heaters; air cleaners. Eliminate use of kerosene space heaters.	Inexpensive carbon monoxide monitors available; check with county Extension office, county health department. No simple test for carbon dioxide; check with county health department. Dosimeters available for nitrogen dioxide available from industrial health and safety supply companies; check with county Extension office, county health department; consult gas utility supplier.
<b>Formaldehyde</b>	Pressed wood products (hardwood plywood wall paneling, particle board, fiberboard) and furniture made with these pressed wood products; ureaformaldehyde foam insulation (UFFI) and furnishings made with ureaformaldehyde; finishes on home textiles, durable press drapes, and some glues	Irritation of skin, eyes, nose and throat; respiratory irritation, respiratory function impairment; cancer; chromosome damage	Use building materials with little or no formaldehyde; seal formaldehyde-containing floor and wall surfaces with vinyl flooring, vinyl wallpaper and formaldehyde-absorbent paint; air cleaners; ventilate area of house where formaldehyde-containing products are in use. House ventilation, outside-vented exhaust fans, air filters and cleaners; restrict use of products or equipment; use alternative products.	Dosimeters available; check with county Extension office, county health department. Visual identification by source and location; personal exposure meters, microenvironment samplers; check with county Extension office, county health department.
<b>Particulates</b>	Dust, pollen, cleaning and cooking sprays; environmental tobacco smoke; fireplaces, wood stoves, kerosene heaters, unvented gas or space heaters	Eye, nose, throat irritation; respiratory infections and bronchitis; lung cancer (long term risk)	Regularly change filters on heating/cooling systems and air cleaners; vent all furnaces to outdoors; eliminate unvented space heaters and gas appliances; have trained professional inspect, clean, and tune-up central heating system; repair leaks promptly.	Bulk sample sent to lab for analysis: contact your county Extension office or DHEC for a list of laboratories; air sample taken by industrial hygienist using special equipment.
<b>Radon</b>	Soil, well, water from	No immediate	House ventilation; seal cracks in	Test your home to determine



<b>Formaldehyde</b>	Pressed wood products (hardwood plywood wall paneling, particle board, fiberboard) and furniture made with these pressed wood products; ureaformaldehyde foam insulation (UFFI) and furnishings made with ureaformaldehyde; finishes on home textiles, durable press drapes, and some glues	Irritation of skin, eyes, nose and throat; respiratory irritation, respiratory function impairment; cancer; chromosome damage	Use building materials with little or no formaldehyde; seal formaldehyde-containing floor and wall surfaces with vinyl flooring, vinyl wallpaper and formaldehyde-absorbent paint; air cleaners; ventilate area of house where formaldehyde-containing products are in use. House ventilation, outside-vented exhaust fans, air filters and cleaners; restrict use of products or equipment; use alternative products.	Dosimeters available; check with county Extension office, county health department. Visual identification by source and location; personal exposure meters, microenvironment samplers; check with county Extension office, county health department.
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<b>Radon</b>	Soil, well-water from private supplies	No immediate symptoms; lung cancer (long term risk); smokers at higher risk of developing radon-induced lung cancer	House ventilation; seal cracks in floors, walls and ceilings; soil ventilation; house pressure control; seal ductwork.	Test your home to determine radon level. Test kits available from county Extension offices in South Carolina. Monitors or detectors available: check with county Extension office, county health department for sources.
<b>Volatile Organic Compounds</b>	Household chemicals and products (including pesticides, painting supplies, solvents, adhesives, cleaners and waxes, moth crystals, air fresheners, fabric protectors, chlorine bleach), aerosol propellants; dry cleaned products; tobacco smoke and combustion processes	Range of possible effects from headaches, eye and respiratory irritations to central nervous system disorders; liver/kidney effects; cancer; chromosome damage	Follow use and storage instructions on labels. Use outside vented exhausts; increase ventilation in house; use solvents and paint products outside when possible; use alternative products; air cleaners.	Dosimeters to test for specific chemicals and materials available from industrial health and safety supply companies; check with county Extension office, county health department for sources; air sample taken by industrial hygienist using special equipment.

\* Controls other than those mentioned may be suitable for individual houses; not all controls listed may be appropriate for individual houses

You and your doctor may not be sure of the cause of an illness. Most pollutants can't be seen, smelled, tasted or felt, and pollutant-related illnesses may mimic the effects of a cold or virus. Also, with many pollution sources in the house, it may be difficult to single out which ones are causing the problem. In addition, since some health effects take years to develop, a person may be unaware of a pollutant that may be contributing to future health problems.

## How do I know if there is a pollution problem in my house?

If you are concerned about air quality in your house, you can make a common-sense diagnosis by documenting health complaints. You can also have tests done or samples taken to test for various pollutants. Professionals often use the following questions when considering the possibility of indoor air pollution:

- What health complaints have been experienced by you or members of your family?
- Are complaints reported by more than one family member?
- When were these complaints first noticed?
- Can you associate these complaints with certain events or activities, like moving to a new house, remodeling, or adding new furnishings, carpeting or draperies?



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- Are complaints reported by more than one family member?
- When were these complaints first noticed?
- Can you associate these complaints with certain events or activities, like moving to a new house, remodeling, or adding new furnishings, carpeting or draperies?
- Do the health complaints occur seasonally, at a particular time of the day, or when a family member is in a particular part of the house?
- How often do the complaints occur and how long do they last?
- Do the complaints or reactions go away when you are away from the house? Do they return when you return home?
- Do visitors have the same reactions or health complaints?
- Are the complaints or reactions less severe when you ventilate the house?

Sampling techniques that detect and measure pollutants in your house vary in difficulty and expense. Testing for some pollutants, like volatile organic compounds (VOC), carbon dioxide and asbestos, may require a certified industrial hygienist using special equipment. These tests can cost up to several hundred dollars. You can purchase inexpensive monitors or detectors which measure for formaldehyde, radon, nitrogen dioxide, water vapor and other pollutants. The devices can be installed and left in your house for a certain period of time. Usually you must return them to a laboratory for analysis. You'll receive test results and follow-up information from the laboratory. The cost of analysis is often included in the purchase price of the monitor or detector.

**One exception is asbestos. A homeowner can send a sample of a suspected asbestos-containing material to a lab for "bulk analysis." Ask the laboratory about how to take the samples and what safety precautions to observe.**

If you suspect that there may be asbestos fibers circulating throughout your house, a different process is used. A sample for airborne asbestos fibers requires special equipment and the skills of a trained asbestos removal contractor or certified industrial hygienist. You may find these listed in the yellow pages or business section of your telephone directory.

## Will I cause indoor pollution problems if I weatherize my home?

Some people who have made homes more energy efficient wonder if they've made the house too "tight." Symptoms associated with a "tight" house can be high relative humidity, interior mildew and molds, frequent condensation on windows or stale air.

Energy conservation measures do not cause indoor air pollution. But when you weatherize a house, you seal up cracks and openings and reduce the natural air flow through the house. When you add storm windows, weather stripping or caulking, concentrations of indoor air pollutants that are already in the home can increase. On the positive side energy conservation measures increase your comfort and usually result in lower heating and cooling costs. You don't have to give up the benefits of weatherization. You can take steps to minimize pollution from sources inside the home. You can also dilute or remove the pollutants.

## What can I do to reduce or remove pollutants?

There are three basic strategies to improve the air quality in your home.

**Source control** is usually the most effective. Some sources, like an unvented kerosene space heater, can be eliminated or replaced with a more efficient, nonpolluting space heater. Other sources, like carpets and enamel paints which contain high levels of VOCs, or furniture which can contain high levels of formaldehyde can be replaced by materials with much lower levels, like latex paints or low-formaldehyde upholstery. Ask for these kinds of products where you normally buy the items. Other sources of pollutants, like the propellants in aerosol spray cans, can be eliminated by using a pump sprayer instead.

**Improving ventilation** may lower the concentration of pollutants in your home. Simply opening windows and doors will usually increase the natural ventilation rate. Turning on bathroom or kitchen exhaust fans, which are vented to the outside, can remove pollutants from these rooms. If you have a radon problem, keep a window open when using fans so that more radon is not drawn through the soil and into the house.

NOTE: Exhaust fans can cause backdrafting of combustion appliances if there isn't enough replacement air entering the house. When this happens, combustion exhaust products may spill into the house. If your house is very tight, use a balanced system which includes both exhaust and intake of air.

Larger mechanical ventilation systems can be expensive to install and operate. Whole-house ventilation can be a part of the heating and cooling system or it can be totally separate. An exhaust-only system draws replacement air through various openings throughout the house. A balanced system adds fresh air intakes to supply the same amount of air which is exhausted from the house. The system might include some types of heat recovery which use outgoing warm air to preheat incoming cold winter air.



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If you look into a whole-house ventilation system, be sure that:

- the system supplies fresh air to bedroom(s) and living areas,
- exhaust air is removed from the kitchen and bathroom(s), and
- the distribution system is effective to all other rooms in the house. Sometimes source control can be less expensive than increasing ventilation which can also increase energy costs.

**Air cleaners** can be effective for removing some pollutants. Air cleaners are generally designed to remove particles and some gases from the air.

The effectiveness of an air cleaner depends on:

- how well it collects pollutants from the air (percentage efficiency rate);
- how much air it draws through the cleaning or filtering element (cubic feet per minute) and
- whether it removes particles, gases or both. The effectiveness of air cleaners for radon reduction in the home has not been established and at present is not recommended by the U. S. Environmental Protection Agency.

## Where can I go for more information or assistance?

Your county Cooperative Extension Service office has additional materials on indoor air quality, sources of monitoring devices and names of local or county health agencies who can provide assistance. They can also refer you to an Extension specialist at Clemson University for general information as well as information about research, technical studies, and state and federal agencies who work with indoor air quality.

Your local health department may also be able to help or refer you to an appropriate state agency. Your telephone directory yellow pages may also have listings for commercial firms which supply testing devices or other services. Check under such headings as "Industrial Hygienists," "Formaldehyde Dosimeters," "Asbestos Sampling/Removal," "Pesticide Sampling," "Radon Dosimeters/ Samplers," and "Industrial Health and Safety Supply."

## Glossary

**Backdrafting** - A condition in which the normal movements of combustion gases up a flue is reversed, causing the combustion products to enter the home. Backdrafting can occur when depressurization in the house overcomes the natural tendency of the exhaust gases to rise.

**Exhaust Fan** - A fan which blows indoor air out of a house. Exhaust fans can cause outdoor air and radon to leak in at other parts of the house to make up for the air blown out by the exhaust fan. Exhaust fans can also cause backdrafting.

**Heat Recovery Ventilators/Heat Exchangers** -Equipment used to transfer heat from one air flow to another. Heat from indoor air being exhausted to the outside is transferred to incoming air from the outdoors without the two air flows being mixed.

**Infiltration** - The unplanned movement of outdoor air or radon into a house through leaks and cracks in the house.

**Radon** - Radon is the only naturally occurring radioactive gas. The term is usually used to refer to radon 222, the radon isotope which is



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**Tight House** - A house with a low air exchange rate, often below 0.5 air changes per hour (ACH).

**Ventilation Rate** - The rate at which outdoor air enters a house displacing indoor air. The ventilation rate depends on the house construction, weather conditions, and the use of appliances (like fans) that affect air movement. The rate is commonly expressed in terms of ACH or cubic feet per minute. It includes both natural ventilation (infiltration) and mechanical ventilation.

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*This publication was adapted, with permission, by Craig Dewitt, Clemson Extension Housing Specialist, from a similar document published by North Carolina State University.*

*For more information contact any of these numbers: Clemson University Housing Institute (803) 656-0114 South Carolina Department of Health and Environmental Control (800) 768-0362 United States Environmental Protection Agency (800) SOS-RADON.*

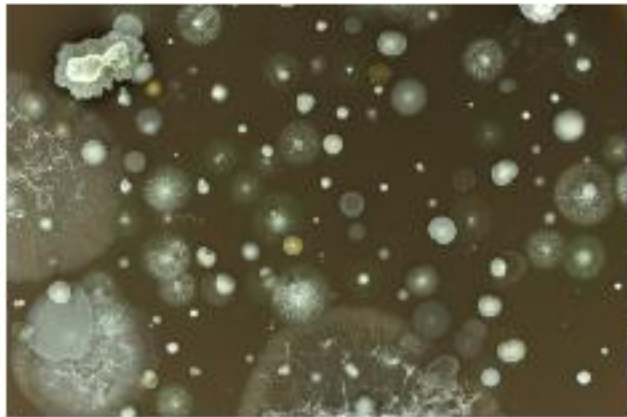
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*Reviewed for NASD: 04/2002*



# INDOOR ENVIRONMENTAL QUALITY



Indoor environmental quality (IEQ) refers to the quality of a building's environment in relation to the health and wellbeing of those who occupy space within it. IEQ is determined by many factors, including lighting, air quality, and damp conditions. Workers are often concerned that they have symptoms or health conditions from exposures to contaminants in the buildings where they work. One reason for this concern is that their symptoms often get better when they are not in the building. While research has shown that some respiratory symptoms and illnesses can be associated with damp buildings, it is still unclear what measurements of indoor contaminants show that workers are at risk for disease. In most instances where a worker and his or her physician suspect that the building environment is causing a specific health condition, the information available from medical tests and tests of the environment is not sufficient to establish which contaminants are responsible. Despite uncertainty about what to measure and how to interpret what is measured, research shows that building-related symptoms are associated with building characteristics, including dampness, cleanliness, and ventilation characteristics.

## On this Page

- [NIOSH Resources](#)
- [Health Hazard Evaluations](#)
- [NIOSHTIC-2 Search](#)
- [Other Resources](#)

Indoor environments are highly complex and building occupants may be exposed to a variety of contaminants (in the form of gases and particles) from office machines, cleaning products, construction activities, carpets and furnishings, perfumes, cigarette smoke, water-damaged building materials, microbial growth (fungal, mold, and bacterial), insects, and outdoor pollutants. Other factors such as indoor temperatures, relative humidity, and ventilation levels can also affect how individuals respond to the indoor environment.

Understanding the sources of indoor environmental contaminants and controlling them can often help prevent or resolve building-related worker symptoms. Practical guidance for improving and maintaining the indoor environment is available.

Workers who have persistent or worsening symptoms should seek medical evaluation to establish a diagnosis and obtain recommendations for treatment of their condition.

## Indoor Environmental Quality Topic Links

[Dampness and Mold in Buildings](#)

[Building Ventilation](#)

[Construction and Renovation](#)

[Chemicals and Odors](#)

## NIOSH Resources

### Building Air Quality

[Building Air Quality Action Plan](#)





## Indoor Air

Indoor Air Home

Basic Information

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You are here: [EPA Home](#) » [Air](#) » [Indoor Air](#) » An Introduction to IAQ

## An Introduction to Indoor Air Quality (IAQ)

- [What Causes Indoor Air Problems?](#)
- [Pollutant Sources](#)
- [Amount of Ventilation](#)
- [Indoor Air Pollution and Health](#)
- [Additional Resources](#)
- [About the Indoor Environments Division](#)

### What Causes Indoor Air Problems?

Indoor pollution sources that release gases or particles into the air are the primary cause of indoor air quality problems in homes. Inadequate ventilation can increase indoor pollutant levels by not bringing in enough outdoor air to dilute emissions from indoor sources and by not carrying indoor air pollutants out of the home. High temperature and humidity levels can also increase concentrations of some pollutants.

- [Basic Information About Indoor Air Quality](#)
- [There are three basic strategies to improve indoor air quality](#)
- [Measuring Pollutant Levels and Weatherizing Your Home](#)
- [What if You Live in an Apartment?](#)
- [Do You Suspect Your Office Has an Indoor Air Problem?](#)
- ["The Inside Story: A Guide to Indoor Air Quality"](#)

### Pollutant Sources

There are many sources of indoor air pollution in any home. These include combustion sources such as [oil](#), [gas](#), [kerosene](#), [coal](#), [wood](#), and [tobacco products](#); building materials and furnishings as diverse as deteriorated, [asbestos](#)-containing insulation, wet or damp carpet, and cabinetry or furniture made of certain [pressed wood products](#); products for [household cleaning and maintenance](#), [personal care](#), or [hobbies](#); central heating and cooling systems and humidification devices; and outdoor sources such as [radon](#), [pesticides](#), and outdoor air pollution.

The relative importance of any single source depends on how much of a given pollutant it emits and how hazardous those emissions are. In some cases, factors such as how old the source is and whether it is properly maintained are significant. For example, an improperly adjusted gas furnace can emit significantly more [carbon monoxide](#) than one that is properly adjusted.

Some sources, such as building materials, furnishings, and household products like air fresheners, release pollutants continuously. Other sources, related to activities carried out in the home, release pollutants intermittently. For example, the use of unvented or malfunctioning [stoves](#), [furnaces](#), or [space heaters](#), the use of solvents in cleaning and maintenance, the use of paint strippers in redecorating activities, and the use of cleaning products and pesticides in household cleaning. Pollutant concentrations can remain in the air for long periods after some of these activities.

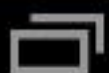
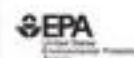
[↑ Top of page](#)

### Amount of Ventilation

If too little outdoor air enters a home, pollutants can accumulate to levels that can pose health and comfort problems. Homes that are built with special mechanical means of ventilation, homes that are designed and constructed to minimize air leakage, or homes that are weatherstripped to keep outdoor air that can "leak" into and out of the home may have higher pollutant levels than other homes. However, in cold weather conditions can drastically reduce the amount of outdoor air that enters a home, pollutants can build up to levels that can pose health and comfort problems.

#### Basic Information About Indoor Air Quality

- [Asbestos](#)
- [Biological](#)
- [Carbon Monoxide](#)
- [Formaldehyde](#)
- [Products](#)
- [Lead \(Pb\)](#)
- [Nitrogen](#)
- [Pesticides](#)
- [Radon \(Rn\)](#)
- [Respirable](#)
- [Secondhand](#)
- [Environm](#)
- [Stoves, H](#)
- [Chimneys](#)
- [Volatile C](#)
- [\(VOCs\)](#)

[Read "Care for Your Home: A Guide to Indoor Air Quality"](#)



[Home](#) > [Healthy Air](#) > [At Home](#) > [In-depth Resources](#)

## Keep Pollution Out Of Your Home

Make healthy air in your home your goal. How? First, keep pollution out. Second, ventilate to clean the air. Here are some easy, but important tips for healthy indoor air. For more details, click on the link in each tip.

### Keep Sources of Pollution Out of Your Home

- » Declare your home a [smokefree](#) zone. Never let anyone smoke indoors. Ask smokers to go outside.
- » Test your home for [radon](#), an invisible gas that causes lung cancer. Every home should be tested since radon may be found in any home. If your home has high radon, it can be fixed.
- » Keep humidity levels under 50 percent. Use a dehumidifier or air conditioner, as needed. Clean equipment regularly so they don't become a source of pollution themselves.
- » Fix all leaks and drips in the home. Standing water and high humidity encourage the growth of mold and other pollutants.
- » Put away food, cover trash and use baits to [control pests](#), like cockroaches.
- » Avoid [burning wood](#) because it adds pollution indoors and out. Don't use outdoor wood boilers, also called hydronic heaters, to heat your home's water. They add unhealthy soot to the air in your neighborhood.
- » Don't use scented candles or [fragrances](#) to hide odors. Figure out what is causing the odor, then clean that up and ventilate to add fresh air.
- » Use cleaning, household and hobby products that are less toxic. Don't store [hazardous chemicals](#) in your home.

### Ventilate To Clean Dirty Air Indoors

- » Use exhaust fans in bathrooms to [remove moisture and gases](#) from the house.
- » Fit your kitchen with an [exhaust](#) fan that moves the air to the outside. Use the fan or open a window when cooking to remove fumes and airborne particles.
- » Make sure gas appliances [vent completely](#) to the outside. Do not use ventless stoves.
- » Have gas or oil stoves, dryers or water heaters inspected by a qualified technician once a year. Install a [carbon monoxide](#) detector near your bedrooms.
- » If you paint or use hobby supplies or [chemicals](#) in your home, add extra ventilation. Open the windows and use a portable window fan to pull the air out of the room.
- » Never idle your car in an attached garage.





[Home](#) > [Healthy Air](#) > [At Home](#) > [Healthy Air at Home](#)

## Preventing Problems

Whether you are living in your current home or want to build or remodel, make healthy air your goal. To do that, first, control the sources and second, ventilate. Here are easy, but important steps for keeping unhealthy air out of your home. For more details, click on the links in each tip.

### Keep Sources of Pollution Out of Your Home

The best way to protect your family at home is to avoid air pollution in the first place. Here are some of the most important steps you can take:

- » Make sure no one smokes indoors.
- » Keep rain, groundwater and humid air outside.
- » Protect against radon, a leading cause of lung cancer.
- » Make sure anything that burns gas is vented to the outdoors.

For more tips, [click here](#).

### Ventilate To Clean Dirty Air Indoors

Fresh air needs to come indoors; air pollution from indoors needs to go outside. Be sure to do the following:

- » Install and run exhaust fans in the kitchen and bathroom.
- » Completely vent gas-burning stoves, dryers or water heaters to the outside.
- » Open windows and use extra exhaust fans when you're working with paints or chemicals indoors.
- » Don't idle your car in an attached garage.

For more tips, [click here](#).

### Tips for New Construction or Remodeling

- » Plan your home for the climate where you live.
- » Plan to keep moisture out. That means rain, groundwater and humid air.
- » Make sure fresh air can get in and dirty air out.
- » Keep radon out.
- » Avoid building products that add or keep pollution indoors.
- » Leave old lead paint and asbestos alone, if possible. If they must be removed, seek professional help.

For more tips, [click here](#).

### Looking To Save Energy?

We all want to save energy in our homes. But not everything you can do to make your home more energy efficient is good for the air in your home. [Click here](#) for tips for doing both.



[Home](#) > [Healthy Air](#) > [At Home](#) > [In-depth Resources](#)

## How To Know If There Is A Problem

Concerned that the air in your home or workplace may be harming your health or someone else's? Do a little digging to find the likely culprit. Walk through the building and ask a few questions to discover if the indoor air is causing a problem. Then click on links to learn more about potential sources of indoor air pollution.

### In your home

Do health symptoms improve when you leave the building? Do they return when you come back into the building? If so, you may have an indoor air pollution problem and should explore the following potential sources.

- » Is anyone smoking indoors? No one should [smoke indoors](#).
- » Can you see or smell mold or mildew?
- » Is the humidity regularly above 50 percent?
- » Are there leaks or standing water anywhere—kitchen, basement, attic?
- » Are all fuel-burning appliances (gas stoves, water heaters, fireplaces) fully vented to the outdoors?
- » Is there an attached garage or basement where cars, lawnmowers or motorcycles are stored?
- » Are household chemicals, paints or solvents stored indoors or in an attached garage or basement?
- » Have you recently remodeled or added new furniture, carpeting or painted?
- » Do you use odor-masking chemicals or "air-freshening" devices?
- » Has kitchen or food garbage been covered and removed?
- » Have you used pesticides recently?
- » Have you tested your home for radon? Although radon doesn't cause noticeable, physical symptoms, you should test your home for this dangerous substance.

### In your workplace

Do health symptoms improve when you leave the building? Do they return when you come back into the building? If so, you may have an indoor air pollution problem and should explore the following potential sources.

- » Are there machines indoors that could be emitting odors, particles or chemicals, including copiers or printers?
- » Are there chemicals used in the work that emit odors, particles or gases? Are the emissions properly controlled and/or exhausted to the outside?
- » Have you recently remodeled or added new furniture, carpeting or painted?
- » Has anyone brought in materials or products that give off odors, gases or particles, such as sprays, perfumes or fragrances?
- » Has food been stored in the kitchen or other areas of the workplace?
- » Has kitchen or food garbage been removed?
- » Are there outside sources of odors or chemicals coming indoors, such as vehicle exhaust, roofing materials or dust from construction?
- » Are heating, air conditioning and ventilation systems working properly and well-maintained? Are they sized properly for the space? Are vents or grilles blocked?
- » Is anyone smoking indoors? No one should [smoke indoors](#).
- » Can you see or smell mold or mildew?
- » Is the humidity regularly above 50 percent?
- » Are there leaks or standing water anywhere?









CDC - Air Po...



Indoor Air - ...



CPSC - S...



http://www.cpsc.gov/en/Safety-Education/



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## Light Pollution in the U.S., the Pacific Northwest and Montana



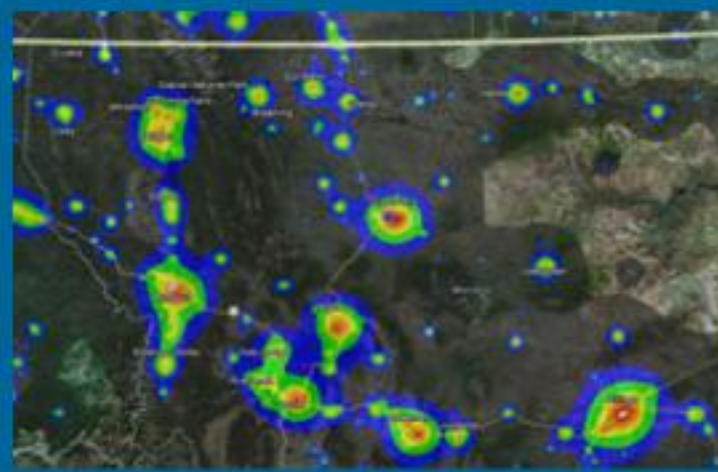
Light Pollution In The United States

Class	Visual Map	Visual Rating	The Description	Why Not	Observational Impact	Guidelines for Observers	Region and Climate	Light-Sensitive Areas
1		100-150	Extremely dark sky, no light pollution visible.	None.	Excellent for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
2		150-200	Very dark sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
3		200-250	Dark sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
4		250-300	Medium-dark sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
5		300-350	Medium sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
6		350-400	Medium-light sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
7		400-450	Light sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
8		450-500	Light sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
9		500-550	Light sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.
10		550-600	Light sky, some light pollution visible.	None.	Good for observing faint objects.	Only visible in the darkest areas of the sky.	Mostly in the western United States, particularly in the Pacific Northwest and Montana.	None.

The Bortle Light Pollution Scale



Light Pollution In The Pacific Northwest



Light Pollution In Montana

Click on any of the four thumbnail images above for a larger view.

As you can easily see from the overall map of the United States above, light pollution is a major problem, particularly in the eastern half of the nation. The lower two images show close-up views of the Pacific Northwest on the left and Montana on the right. Because of its lower population density, light pollution in the western United States is less severe than that of the eastern portion. It is obvious, though, that the urban areas of the west are no less susceptible to the detrimental effects of light pollution than our eastern neighbors.

It is estimated that, of the \$5,000,000,000 in annual energy costs that are wasted world-wide, the United States alone contributes two billion dollars of that total.

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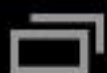
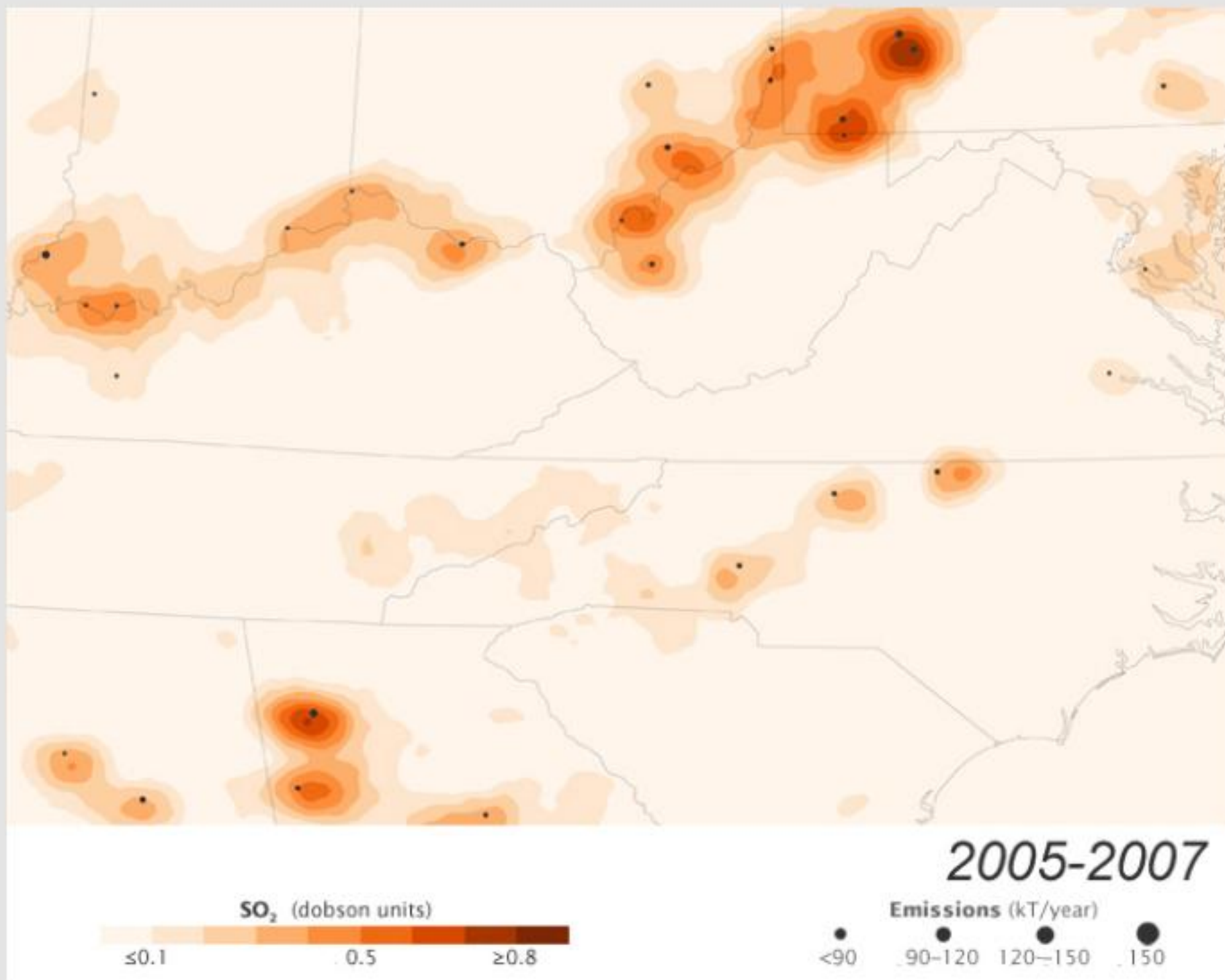


### NASA Satellite Confirms Sharp Decline in Pollution from U.S. Coal Power Plants

12.01.11

A team of scientists have used the Ozone Monitoring Instrument (OMI) on NASA's Aura satellite to confirm major reductions in the levels of a key air pollutant generated by coal power plants in the eastern United States. The pollutant, sulfur dioxide, contributes to the formation of acid rain and can cause serious health problems.

The scientists, led by an Environment Canada researcher, have shown that sulfur dioxide levels in the vicinity of major coal power plants have fallen by nearly half since 2005. The new findings, the first satellite observations of this type, confirm ground-based measurements of declining sulfur dioxide levels and demonstrate that scientists can potentially measure levels of harmful emissions throughout the world, even in places where ground monitoring is not extensive or does not exist. About two-thirds of sulfur dioxide pollution in American air comes from coal power plants. *Geophysical Research Letters* [published details of the new research this month.](#)



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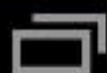
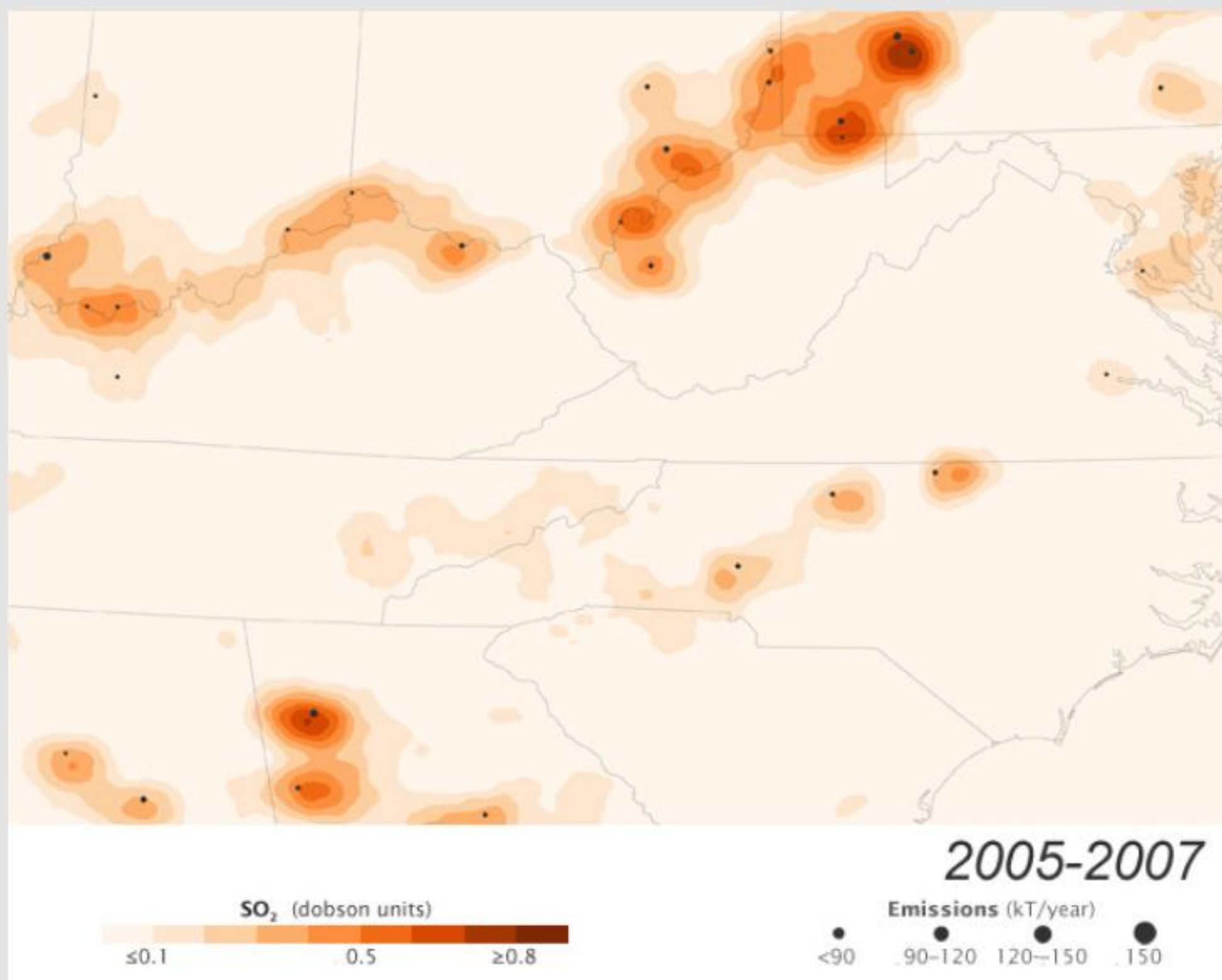
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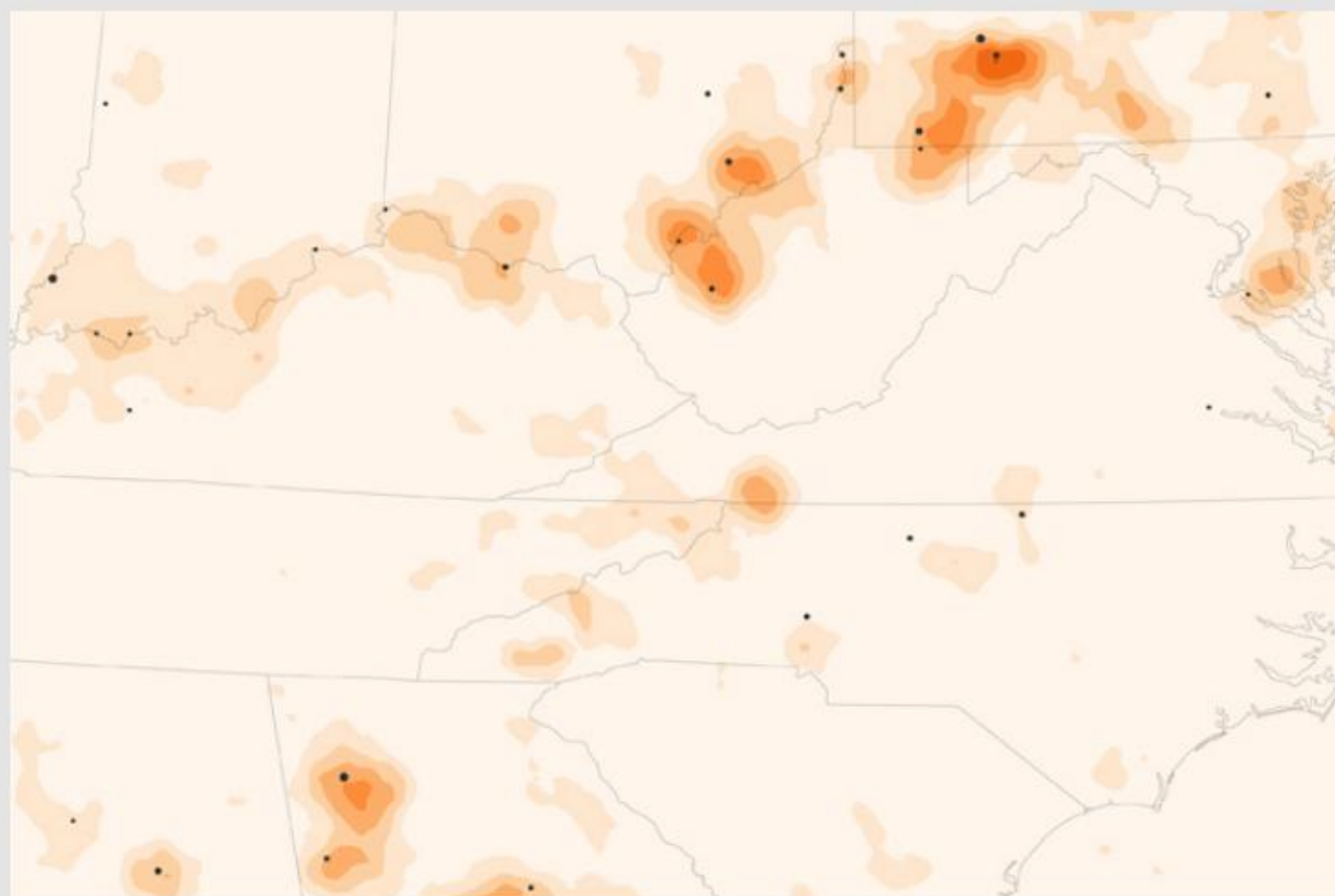
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## 2008-2010



These maps show average sulfur dioxide levels measured by the Aura satellite for the periods 2005-2007 (top) and 2008-2010 (bottom) over a portion of the eastern United States. The black dots represent the locations of many of the nation's top sulfur dioxide emissions sources. Larger dots indicate greater emissions. (Credit: NASA's Earth Observatory)

› [Larger image \(2005-2007\)](#)

› [Larger image \(2008-2010\)](#)

The scientists attribute the decline in sulfur dioxide to the Clean Air Interstate Rule, a rule passed by the U.S. Environmental Protection Agency in 2005 that called for deep cuts in sulfur dioxide emissions. In response to that rule, many power plants in the United States have installed desulfurization devices and taken other steps that limit the release of sulfur dioxide. The rule put a cap on emissions, but left it up to power companies to determine how to reduce emissions and allowed companies to trade pollution credits.

While scientists have used the Ozone Monitoring Instrument to observe sulfur dioxide levels within large plumes of volcanic ash and over heavily polluted parts of China in the past, this is the first time they have observed such subtle details over the United States, a region of the world that in comparison to fast-growing parts of Asia now has relatively modest sulfur dioxide emissions. Just a few decades ago, sulfur dioxide pollution was quite severe in the United States. Levels of the pollutant have dropped by about 75 percent since the 1980s due largely to the passage of the Clean Air Act.

Vitali Fioletov, a scientist based in Toronto at Environment Canada, and his colleagues developed a new mathematical approach that made the improved measurements a reality. The approach centers on averaging measurements within a 30 miles radius (50 km) of a sulfur dioxide source over several years. "Vitali has developed an extremely powerful technique that makes it possible to detect emissions even when levels of sulfur dioxide are about four times lower than what we could detect previously," said Nickolay Krotkov, a researcher based at NASA's Goddard Space Flight Center in Greenbelt, Md., and a coauthor of the new paper.

The technique allowed Fioletov and his colleagues to pinpoint the sulfur dioxide signals from the 40 largest sulfur dioxide sources in the United States --



Smokestacks from a coal power plant in Maryland jut into a hazy skyline. Credit:





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The technique allowed Fioletov and his colleagues to pinpoint the sulfur dioxide signals from the 40 largest sulfur dioxide sources in the United States -- generally coal power plants that emit more than 70 kilotons of sulfur dioxide per year. The scientists observed major declines in sulfur dioxide emissions from power plants in Alabama, Georgia, Indiana, Kentucky, North Carolina, Ohio, Pennsylvania and West Virginia by comparing levels of the pollutant for an average of the period 2005 to 2007 with another average from 2008 to 2010.

"What we're seeing in these satellite observations represents a major environmental accomplishment," said Bryan Bloomer, an Environmental Protection Agency scientist familiar with the new satellite observations. "This is a huge success story for the EPA and the Clean Air Interstate Rule," he said.

The researchers focused their analysis on the United States to take advantage of the presence of a robust network of ground-based instruments that monitor sulfur dioxide emissions inside power plant smokestacks. The ground-based instruments have logged a 46 percent decline in sulfur dioxide levels since 2005 -- a finding consistent with the 40 percent reduction observed by OMI.

"Now that we've confirmed that the technique works, the next step is to use it for other parts of the world that don't have ground-based sensors," said Krotkov. "The real beauty of using satellites is that we can apply the same technique to the entire globe in a consistent way." In addition, the team plans to use a similar technique to monitor other important pollutants that coal power plants release, such as nitrogen dioxide, a precursor to ozone.

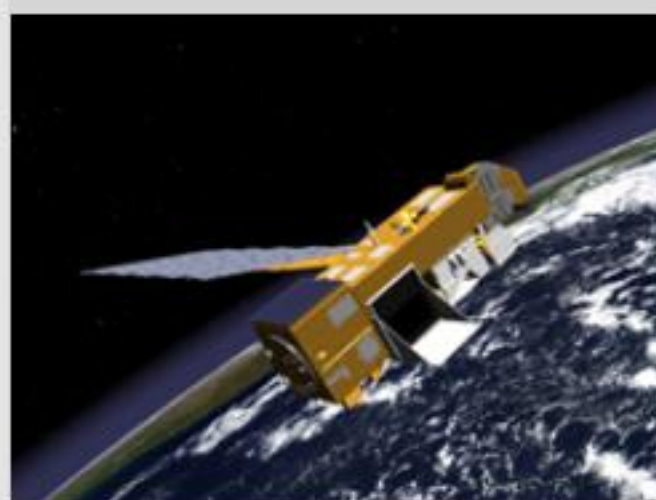
OMI, a Dutch and Finnish built instrument, was launched in 2004, as one of four instruments on the NASA Aura satellite, and can measure sulfur dioxide more accurately than any satellite instrument flown to date. Though OMI remains in very good condition and scientists expect it to continue producing high-quality data for many years, the researchers also hope to use data from an upcoming Dutch-built OMI follow-on instrument called TROPOMI that is expected to launch on a European Space Agency satellite in 2014.

On July 6, 2011, the U.S. Environmental Protection Agency (EPA) finalized the Cross-State Air Pollution Rule (CSAPR), requiring 27 states to significantly reduce power plant emissions that contribute to ozone and fine particle pollution in other states. This rule replaces EPA's 2005 Clean Air Interstate Rule (CAIR). A December 2008 court decision kept the requirements of CAIR in place temporarily but directed EPA to issue a new rule to implement Clean Air Act requirements concerning the transport of air pollution across state boundaries. This action responds to the court's concerns.



Smokestacks from a coal power plant in Maryland jut into a hazy skyline. **Credit:** Jeff Stehr, University of Maryland

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Artist's concept of the Aura spacecraft.

**Credit:** NASA

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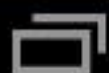
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# History Shows U.S. Can Tackle Pollution And Climate Change

By  Guest Blogger on Jan 23, 2013 at 11:05 am

By Arpita Bhattacharyya, Center for American Progress

President Obama's strong remarks on climate change yesterday left the environmental community hopeful that actions will soon follow his words. The Center for American Progress has laid out a blue print for how the President can move forward on climate change and energy, and most of those recommended actions can be taken now through executive orders, including setting carbon-pollution standards for existing power plants, oil refineries, and other major industrial sources under the federal Clean Air Act.



President Nixon signs the 1969 National Environmental Protection Act

If President Obama takes these up, he will inevitably face push back from members of Congress who falsely claim that the economic costs are too high for crucial Environmental Protection Agency public health regulations. In reality, these regulations have saved thousands of lives and strengthened our economy. China's extreme air pollution earlier this month serves as reminder of why we can't let anti-public health rhetoric shake our resolve on crucial live saving regulations.

Air pollution levels in Beijing literally went off the charts earlier this month. On the normal scale of 1 to 500 for measuring small pollution particulates harmful for health known as PM2.5, the U.S. Embassy monitors in Beijing recorded 755 on January 12th. To put that in context, 50 or below is considered good air quality by the U.S. Environmental Protection Agency's Air Quality Index. 301 to 500 is considered extremely hazardous and people are advised against going outdoors. The 755 rating surpassed the "crazy bad" pollution record set two years ago in China. The Chinese government responded by pulling government vehicles off the road and limiting activity at construction sites. Meanwhile, hospitals were full of patients with heart and respiratory ailments. China's challenges with pollution serves as a reminder for Americans on how important Environmental Protection Agency regulations are for protecting public health.

While China's air pollution problems may sound extreme and incomparable to air quality here in the U.S., we actually did face a very similar environmental situation during its industrialization. The reason? Tight regulatory standards for public health didn't exist yet. In the 1940s and 1950s, smog had blanketed major cities while sewage and industrial waste infected U.S. rivers. In 1948, pollutants trapped over the industrial city of Donora, Pennsylvania killed twenty and permanently injured hundreds.

Slowly, the American Public became more aware of the effect of pollution on public health and demanded action.

In 1962, the publication of Silent Spring on the harmful impacts of DDT on animal and human health lit a spark among environmentalists and the general public alike to address industrial



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In 1962, the publication of *Silent Spring* on the harmful impacts of DDT on animal and human health lit a spark among environmentalists and the general public alike to address industrial pollution. As the decade went on, teach-ins, TV shows, and various forums educated the public on threats the humans and the environment faced from pollution. Then in June 1969, the Cuyahoga river caught on fire (for the umpteenth time) due to oil slicked debris and pollution from decades of industrial waste. The flaming river was a powerful symbol of the costs of unchecked industrialization, and Americans demanded government action to clean up pollution.

At the end of 1969, President Nixon and Congress sprang into action to address public concerns on the environment. Congress passed the 1969 National Environmental Policy Act (NEPA) that declared a national environmental policy, promoted efforts to protect the environment and public health, and encouraged deeper understanding of the threats humans and ecosystems faced.

On New Year's Day, 1970, when President Nixon signed the National Environmental Policy Act (NEPA), he said he was:

**"[C]onvinced that the 1970s absolutely must be the years when America pays its debt to the past by reclaiming the purity of its air, its waters, and our living environment. It is literally now or never."**

As the year progressed, President Nixon decided that a new independent agency was necessary to coordinate the environmental work across the administration. On December 2nd, 1970, the Environmental Protection Agency opened with Assistant Attorney General William D. Ruckelshaus at the reins. By the end of the month, Congress had passed the Clean Air Act, giving the EPA the authority to establish national air quality standards, national standards for significant new pollution sources, and facilities emitting hazardous substances. With NEPA and the Clean Air Act as bookends to 1970, President Nixon and the 91st Congress paved the way for the vital health standards that protect Americans today.

President Nixon set up the regulatory system that continues to protect us today. Notably, a Republican President was able to hear the public and take sweeping action to clean up our air and water, action that the anti-regulation Republican party of today repeatedly fights against.

But the reason that the U.S. doesn't make headlines for extreme pollution like China is that we continue to fight for public health with new and improved air quality standards. The EPA bases its rulemaking on the most current, best available science. As our knowledge grows about new and old pollutants alike, the EPA is legally bound to set new standards to ensure healthy environments surround our schools and workplaces.

For example, science in the last decades has proved beyond doubt that carbon pollution will be harmful for human livelihoods. In June 2012, the U.S. Court of Appeals for the District of Columbia unanimously declared that the EPA is "unambiguously correct" that the Clean Air Act requires it to regulate carbon pollution. As science evolves, our policies must as well. Our work is not over just because our air quality isn't as "crazy bad" China's.

In his second term, the Obama Administration has the opportunity to fight for public health standards through the reduction of carbon pollution and smog. Let's continue protecting Americans families and ensure they have safe environments to live, work, and learn now and in the future.

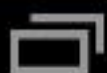
*Arpita Bhattacharyya is Research Assistant to Distinguished Senior Fellow Carol Browner at the Center for American Progress.*

Tags: Air Pollution Carbon Emissions China Clean Air Act Climate Change

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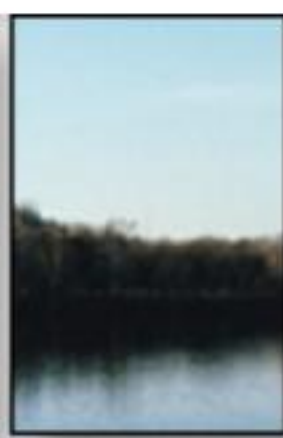
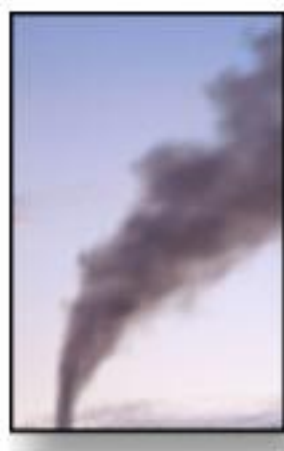






# Coal vs. Wind

Coal generates 44% of our electricity, and is the single biggest air polluter in the U.S.



*Tell me more about:*

- ▶ [Air Pollution](#)
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**Air pollution:** Burning coal causes smog, soot, acid rain, global warming, and toxic air emissions. *Click on its photo to learn more.*

**Wastes generated:** Ash, sludge, toxic chemicals, and waste heat create more environmental problems. *Click on its photo to learn more.*

**Fuel supply:** Mining, transporting, and storing coal levels mountains and pollutes the land, water, and air. *Click on its photo to learn more.*

**Water use:** Coal plants need billions of gallons of cooling water and harm wildlife. *Click on its photo to learn more.*

A typical (500 megawatt) coal plant burns 1.4 million tons of coal each year. As of 2012, there are 572 operational coal plants in the U.S. with an average capacity of 547 megawatts.

Coal pollutes when it is mined, transported to the power plant, stored, and burned. Click on the pictures above left to see more about the kinds of environmental damage caused by coal.

*Power plant photo credit: Warren Gretz, DOE/NREL*





The Clean Air Task Force works to help safeguard against the worst impacts of climate change by catalyzing the rapid global development and deployment of low carbon energy and other climate-protecting technologies through research and analysis, public advocacy leadership, and partnership with the private sector.

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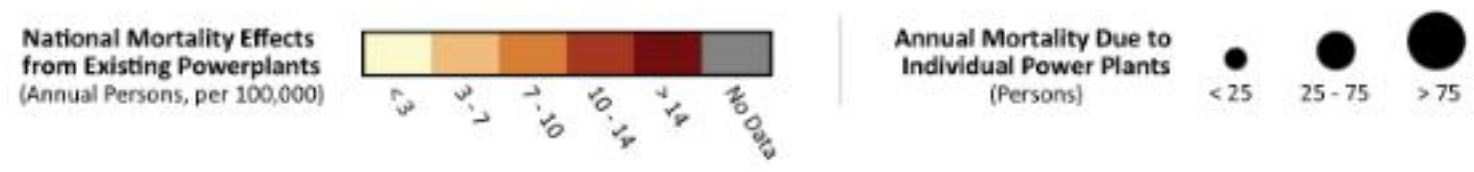
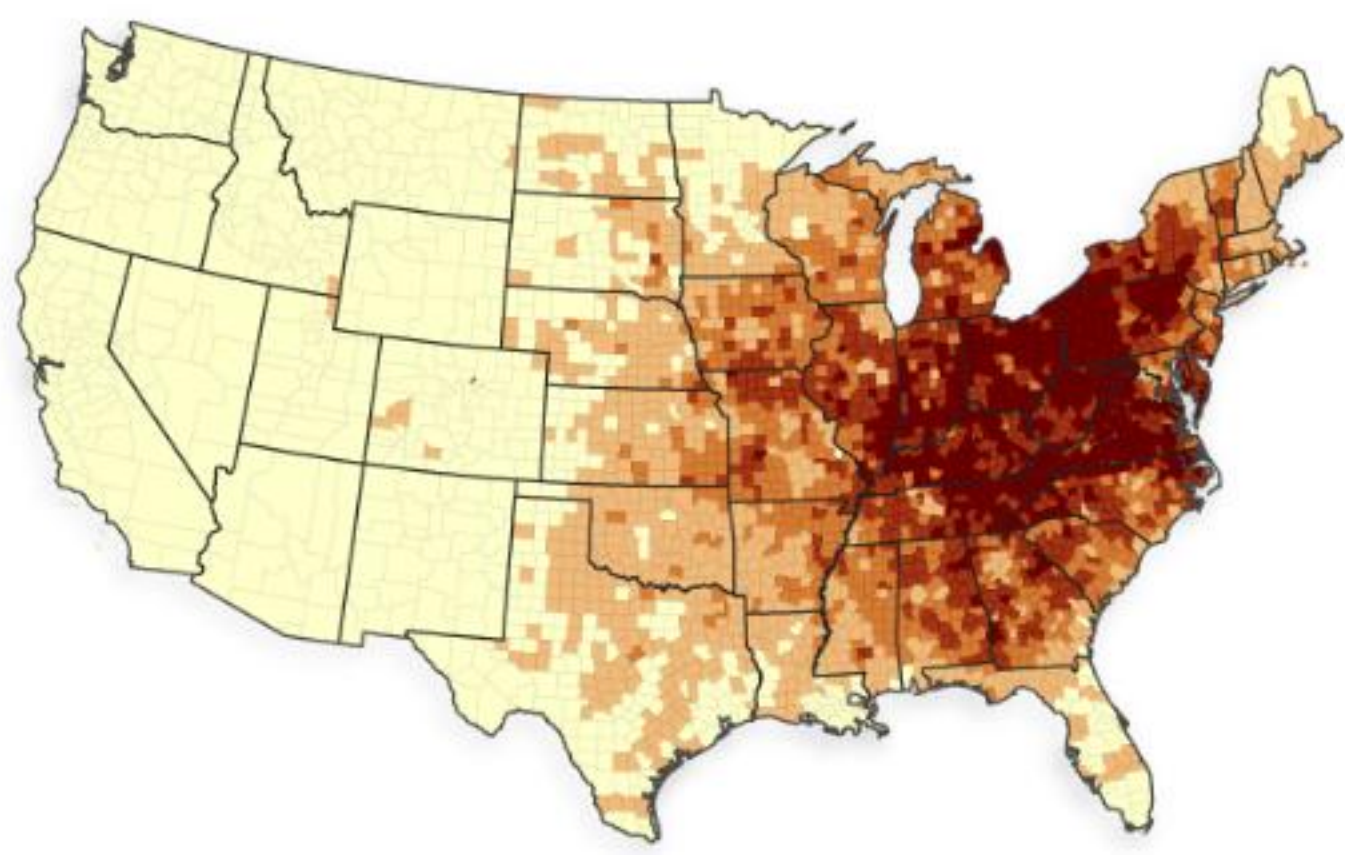
# Death and Disease from Power Plants

In 2000 and again in 2004, Abt Associates issued a study commissioned by the Clean Air Task Force quantifying the deaths and other health affects attributable to the fine particle pollution from power plants. In this newly updated study, CATF examines the progress towards cleaning up one of the nation's leading sources of pollution. The report finds that over 13,000 deaths each year are attributable to fine particle pollution from U.S. power plants. This is almost half the impact that our 2004 study found and is reflective of the impact that state and federal actions have had in reducing power plant emissions by roughly half. However, much more still needs to be done.

The interactive map below allows you to learn of the risk in your state or county simply by clicking on the Google Map below. You can click on your state, zoom into your county, or click on a power plant to view a variety of health impacts and other data. A new tool also available is a downloadable [Google Earth file](#), which once downloaded and launched in Google Earth, will allow you to explore a whole host of data and health impacts around the country.

Find Your Risk from Power Plant Pollution  
(Click on Your State Below)

- Additional Resources:
- [The Toll from Coal Report](#)
- [Abt Associates white paper](#)
- [Per Capita Power Plant Impacts by Metropolitan Area](#)
- [Total Power Plant Impacts by Metropolitan Area](#)
- [Per Capita Power Plant Impacts by State](#)
- [Total Power Plant Impacts by State](#)
- [Toll from Coal Google Earth file](#)
- [Data Annex](#)



Data is estimated 2010 impacts. All monetary values are expressed in thousands of dollars.  
County level data is health impacts/100,000 persons.



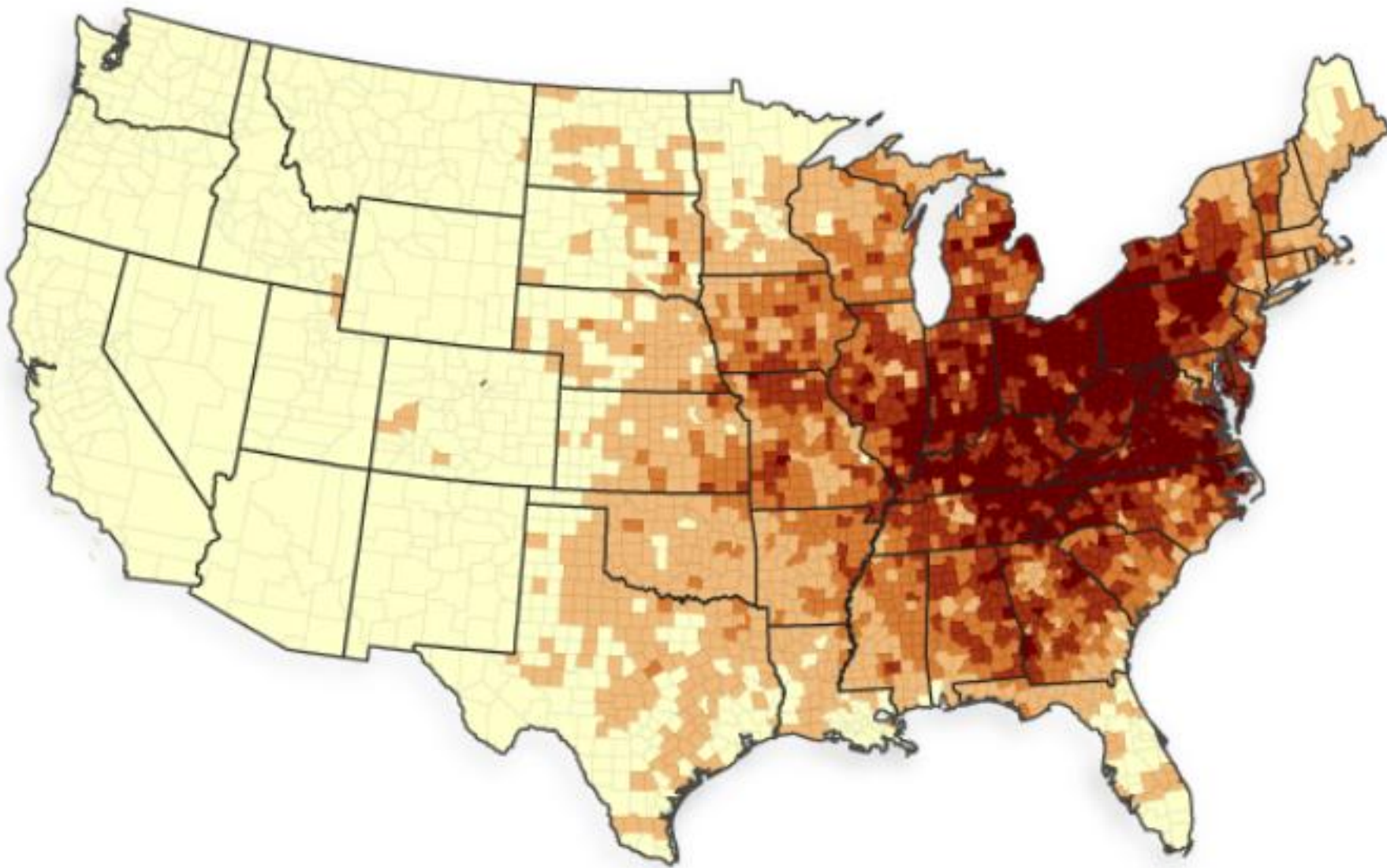
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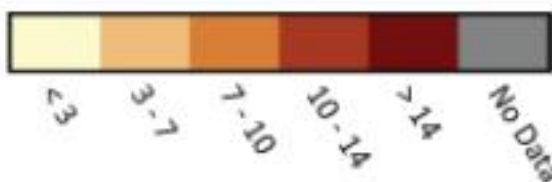
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## Find Your Risk from Power Plant Pollution

(Click on Your State Below)



**National Mortality Effects from Existing Powerplants**  
(Annual Persons, per 100,000)



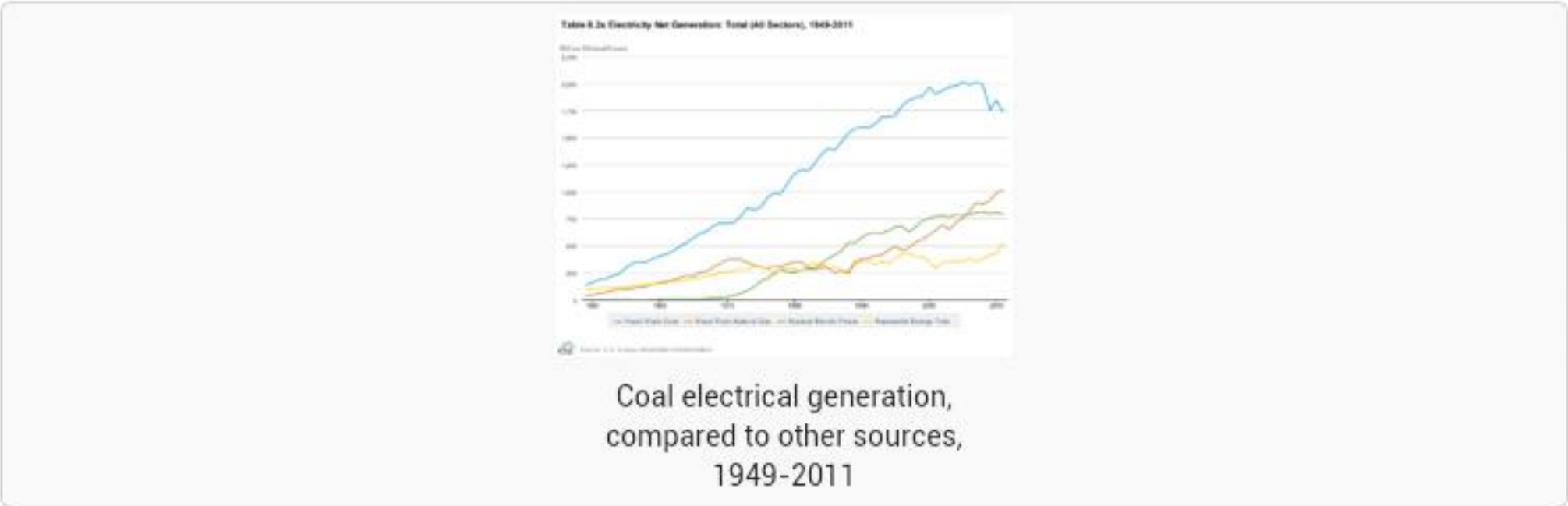
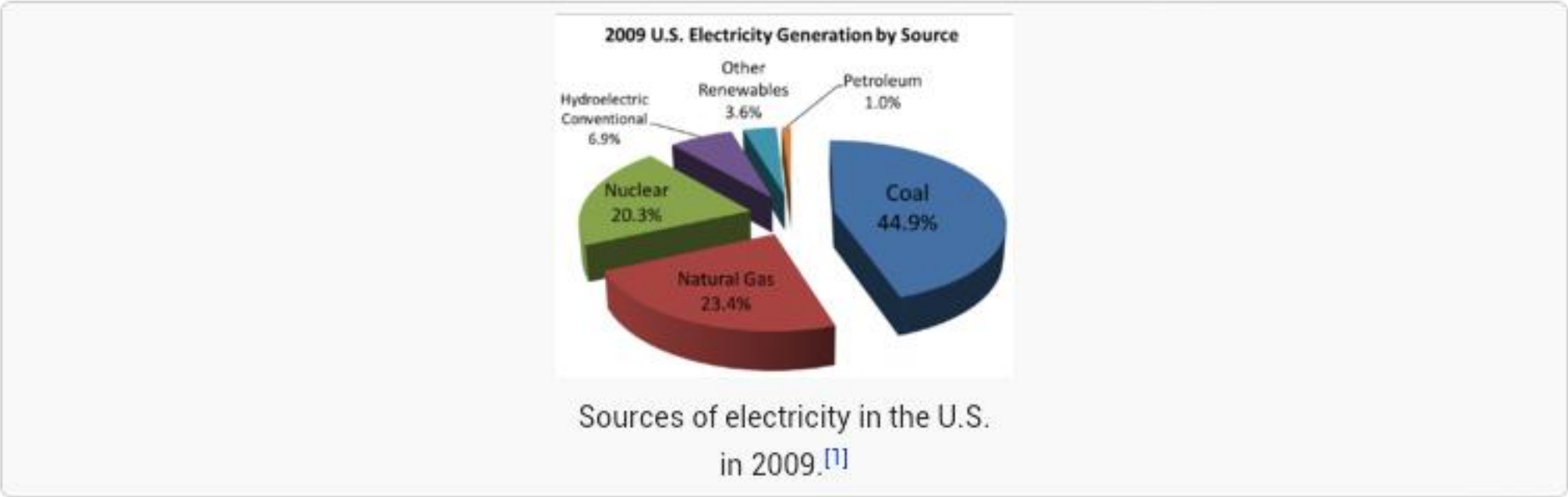
**Annual Mortality Due to Individual Power Plants**  
(Persons)



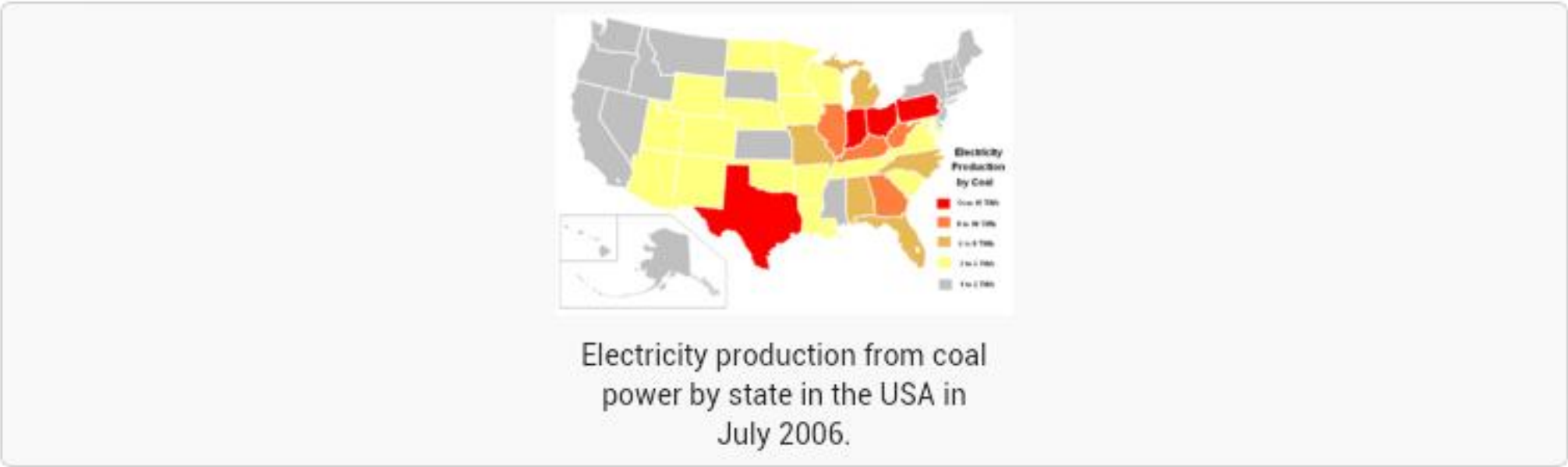
Data is estimated 2010 impacts. All monetary values are expressed in thousands of dollars.  
County level data is health impacts/100,000 persons.



# Coal power in the United States



See also: [Coal mining in the United States](#)



**Coal power in the United States** accounted for 42% of the country’s electricity production in 2011.<sup>[1]</sup> Utilities buy more than 90 percent of the coal mined in the United States.<sup>[2]</sup>

In 2009, there were 1436 coal-powered units at the electrical utilities across the US, with the total nominal capacity of 338.732 GW<sup>[3]</sup> (compared to 1024 units at nominal 278 GW in 2000).<sup>[4]</sup> The actual average generated power from coal in 2006 was 227.1 GW (1.991 trillion kilowatt-hours per year),<sup>[5]</sup> the highest in the world and still slightly ahead of China (1.95 trillion kilowatt-hours per year) at that time.<sup>[6]</sup> In 2000, the US average production of electricity from coal was 224.3 GW (1.966 trillion kilowatt-hours for the year).<sup>[5]</sup> In 2006, US electrical generation consumed 1,026,636,000 short tons (931,349,000 metric tons) or 92.3% of the coal mined in the US..<sup>[7]</sup>



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## The Opinion Pages

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## Limiting Carbon Dioxide Pollution by Power Plants

By DANIEL F. BECKER and JAMES GERSTENZANG

Published: February 26, 2013

WASHINGTON

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ELECTRIC power plants spew about 40 percent of the carbon dioxide pollution in the United States, but, amazingly, there are no federal limits on utility emissions of this potent greenhouse gas. The Obama administration plans to remedy this situation by drafting rules that

would curtail these discharges from existing plants. The president should make sure they are tough. Nothing he can do will cut greenhouse gases more.

By accomplishing this under the executive authority Congress granted him in the Clean Air Act, the president will be stepping in where recent Congresses have refused to go. He did the same thing last August, when he toughened auto emissions standards that will result in a new car fleet that averages 54.5 miles per gallon by 2025, and again last spring, when he proposed rules, restricting carbon dioxide emissions, that will effectively prevent the building of new coal-burning power plants.

Now President Obama should require existing power plants to reduce their emissions by at least one-quarter by 2020. These plants emitted 2.2 billion tons of carbon dioxide in 2011, according to the Environmental Protection Agency, so a 25 percent cut would result in a reduction of more than 500 million tons. This would reduce lung-related illness and premature deaths, slow the accumulation of climate-changing gases in the atmosphere and demonstrate to the rest of the world that the United States was serious about taking on global warming.

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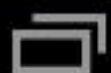
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To achieve these reductions, the rules should favor making homes, buildings and power plants more energy efficient over the more costly conversion of coal-fired plants to natural gas. (Gas-fired power plants emit half as much carbon dioxide as coal-fired plants. But expanding energy efficiency will reduce electricity demand and eliminate the need for the coal plants. Closing them is better than converting them to gas.) The American Council for an Energy-Efficient Economy says the technology exists now to cut electricity use by one-quarter by 2020 through efficiency alone. Based on the average electricity production of the nation's large coal-fired power plants, this would allow for the closing of close to 60 such plants across the nation.

Certainly, the coal and utility industries won't take this lying down. Some coal mines may be closed, and the electric industry will be reconfigured. A study by the Natural Resources Defense Council estimated recently that reducing emissions by at least one-quarter over the next seven years would cost \$4 billion in compliance expenses in 2020. But the reduced hospitalizations and fewer days of work lost to illness, and other health and environmental benefits would save \$25 billion to \$60 billion, the study said. The approach would also stimulate investments of more than \$90 billion in energy efficiency and renewable energy technologies, according to the analysis for the N.R.D.C. by the consulting firm ICF International.

The progression to using less coal will create new jobs to build the highly efficient appliances, wind turbines, solar farms and other technologies that capture renewable energy. In addition, jobs will be created as some states and utilities choose to comply by building natural gas power plants, which should be done only if they won't cause environmental havoc.

The auto industry is beginning to show how strong emissions standards and the technological advances they stimulate can benefit employment. When the new rules were announced last summer, Bob King, president of the United Auto Workers, predicted that they would require "more engineers and more factory workers, expanding employment in the industry." And Ford, which had already



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The New York Times

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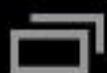
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Now President Obama should require existing power plants to reduce their emissions by at least one-quarter by 2020. These plants emitted 2.2 billion tons of carbon dioxide in 2011, according to the Environmental Protection Agency, so a 25 percent cut would result in a reduction of more than 500 million tons. This would reduce lung-related illness and premature deaths, slow the accumulation of climate-changing gases in the atmosphere and demonstrate to the rest of the world that the United States was serious about taking on global warming.

To achieve these reductions, the rules should favor making homes, buildings and power plants more energy efficient over the more costly conversion of coal-fired plants to natural gas. (Gas-fired power plants emit half as much carbon dioxide as coal-fired plants. But expanding energy efficiency will reduce electricity demand and eliminate the need for the coal plants. Closing them is better than converting them to gas.) The American Council for an Energy-Efficient Economy says the technology exists now to cut electricity use by one-quarter by 2020 through efficiency alone. Based on the average electricity production of the nation's large coal-fired power plants, this would allow for the closing of close to 60 such plants across the nation.

Certainly, the coal and utility industries won't take this lying down. Some coal mines may be closed, and the electric industry will be reconfigured. A study by the Natural Resources Defense Council estimated recently that reducing emissions by at least one-quarter over the next seven years would cost \$4 billion in compliance expenses in 2020. But the reduced hospitalizations and fewer days of work lost to illness, and other health and environmental benefits would save \$25 billion to \$60 billion, the study said. The approach would also stimulate investments of more than \$90 billion in energy efficiency and renewable energy technologies, according to the analysis for the N.R.D.C. by the consulting firm ICF International.

The progression to using less coal will create new jobs to build the highly efficient appliances, wind turbines, solar farms and other technologies that capture renewable energy. In addition, jobs will be created as some states and utilities choose to comply by building natural gas power plants, which should be done only if they won't cause environmental havoc.

The auto industry is beginning to show how strong emissions standards and the technological advances they stimulate can benefit employment. When the new rules were announced last summer, Bob King, president of the United Auto Workers, predicted that they would require "more engineers and more factory workers, expanding employment in the industry." And Ford, which had already doubled its team working on fuel-saving engineering, said it planned to redouble the unit in 2015. Indeed, last week, Ford announced that it was adding 450 jobs at its Brook Park, Ohio, plant to produce its EcoBoost engine.

Not everyone will benefit immediately, of course. As demand for coal drops, some



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Not everyone will benefit immediately, of course. As demand for coal drops, some miners will lose their jobs. The nation owes them economic support, job training and sustainable jobs. There is a precedent for this: the government established a fund to help workers at nuclear weapons plants move to new jobs as the cold war ended.

But even as we reduce power plant pollution, we will need to do more to protect the atmosphere. We should also reduce emissions of such short-lived contributors to global warming as methane by tightening up leaky natural gas systems, and hydrofluorocarbons, which are used in air-conditioning.

Ultimately, we must meet our energy needs largely without coal, oil or gas. We must use energy more efficiently to lower demand to the point that ramped-up clean, renewable energy supplies most of what we require.

By ordering the new auto emissions standards, Mr. Obama took an enormous step in the fight against global warming. In a similarly bold move, he can reduce our reliance on coal, a dirty fuel that is the greatest contributor to the nation's greenhouse gas pollution. By setting stringent power plant standards, he will slow global warming at a fraction of the cost of ignoring it.

*Daniel F. Becker directs the Safe Climate Campaign. James Gerstenzang, the campaign's editorial director, covered the White House and the environment for The Los Angeles Times.*

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## US: Thousands die annually from power-plant pollution

Washington, 17 Oct (IPS/Danielle Knight) - Pollution from electric power plants in the United States shortens the lives of more than 30,000 people every year, according to a new report released here by environmental and health researchers. The study concludes that soot, or fine particle air pollution, from the nation's ageing coal-fired power plants is causing tens of thousands of asthma attacks, cardiac problems and upper and lower respiratory problems each year.

While many have studied air pollution's impact on human health, this is the first attempt to examine the direct health impact of these facilities, according to health experts.

"More people die as a result of the pollution from these plants every year than from drunk driving or homicides, societal woes that everyone agrees are top priorities," says Conrad Schneider, advocacy director of the Boston-based Clean Air Task Force, one of the groups that released the report, "Death, Disease and Dirty Power".

The 25-page report is based on research conducted by Abt Associates, a consulting firm regularly employed by the US Environmental Protection Agency to assess the health benefits of the agency's programmes. The firm developed a model using health studies which link changes in soot concentrations in the environment to changes in risks of death and illness. Using pollution information made publicly available by the power plants themselves - as required by law - Abt Associates then employed this model to estimate the number of probable deaths from exposure to fine particles emitted from power plants. Besides 30,000 annual deaths, fine particle soot from power plants also causes an estimated 603,000 asthma attacks nationwide, according to the study.

"We can only hope the information provided through this study will help crystallise the policy debate leading to dramatic reductions in pollution from dirty power plants," says John Spengler, a professor at the Harvard School of Public Health, who wrote the foreword to the study.

Fine particles are a mixture of a variety of different compounds and pollutants that originate from power plants, diesel trucks, buses and cars. Among particles, fine particles, or particulates, are of the gravest concern, according to researchers, because they can be inhaled deeply, thus evading the human lungs' natural defences.

While acknowledging that vehicle exhaust also causes particulate pollution, the study says that power plants outstrip all other polluters as the largest source of sulphates - the major component of fine particle pollution - in the United States.

The study says that the highest per capita death impacts are in "coal country" or states such as Kentucky, West Virginia and Alabama where dirty sulphur-rich coal is burned in power plants.

Children, the elderly and people with existing respiratory diseases face the greatest risk from exposure to fine particles, according to several scientific studies cited in the report.

Beginning with London's "killer fog" of 1952, in which weather conditions trapped the city in a blanket of hazardous soot, scientists have long argued that particulate pollution from power plants and vehicles causes harmful and even deadly health problems.

The 30-year-old US Clean Air Act has not been successful in controlling soot pollution from power plants, according to the environmental groups releasing the report, including Clear the Air, the National Campaign Against Dirty Power and the Clean Air Task Force.

The law allows old power plants built before the law to circumvent the most protective air emissions standards. As a result, these so-called "grandfathered" power plants are permitted to emit as much as 10 times more nitrogen oxides and sulphur dioxide than modern coal plants.

"The deaths, hospitalisations and lost work time caused by fine particles from power plants can be reduced comprehensively only when the Clean Air Act's 30-year loophole for old, dirty power plants is finally closed,"







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In an attempt to close the loophole, the US Environmental Protection Agency eventually decided in 1997 to set a new national air quality standard. But the electric utility industry and diesel trucking companies are fighting these regulations by suing the agency in court.

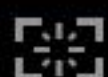
Several bills circulating in Congress are calling for 75 percent reductions in power-plant emissions.

More than half of the asthma attacks due to power plant particulate pollution could be avoided by cleaning up power plants to modern standards, according to Angela Ledford, campaign manager of Clear the Air, a Washington-based group. "The staggering rate of death and disease due to power-plant pollution cries out for federal action," she says.

While electric utility industries are fighting any law that could impact their profit margin, Schneider says the economic benefits of reducing pollution greatly outweigh the costs to industry.

One of the bills before Congress, for example, estimates it will cost \$11.5 billion a year to clean up old power plants. Meanwhile, Abt Associates estimates that the nation loses \$100 billion annually from health care costs and lost work time.

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# Electricity and the Environment

The Minnesota Public Utilities Commission (PUC) requires utilities to disclose environmental information to their customers. The utilities send these disclosures with customer bills twice per year — once prior to the heating season and once prior to the cooling season. This section of the MPCA's Web site is intended to assist the public in understanding the environmental information included in the disclosures.

Coal combustion to produce electricity is the single biggest source of many pollutants in Minnesota. Over half of the electricity generated in Minnesota comes from coal-fired electric power plants. Minnesota receives most of its coal supply by rail from Montana and Wyoming.

Two nuclear plants near the Twin Cities typically account for nearly one-fourth of the state's electricity production. Recent legislation permits the Prairie Island Plant to store additional nuclear waste onsite, extending the plant's operation through 2014. The smaller Monticello nuclear plant is currently licensed through September 2010.

Minnesota has numerous wind farms, particularly in the southwest, and generates electricity from other renewable sources as well, including conventional hydroelectric dams, municipal solid-waste and landfill gas, and wood waste. Minnesota ranks among the leading states in renewable energy generation.

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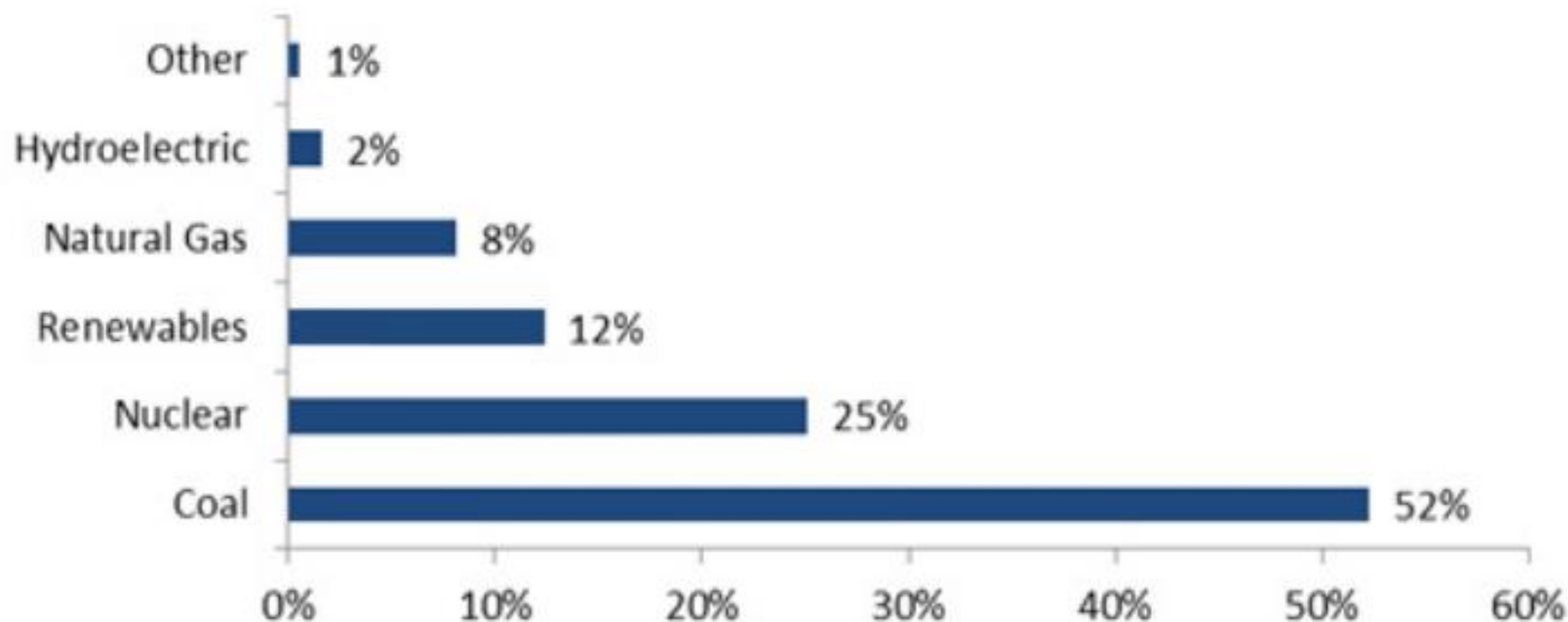
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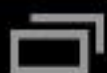
## 2010 Electric Power Generation by Primary Energy Source (Percentage of Megawatthours)

(Data From Energy Information Administration)



## Electric Utility Disclosures

- [Alliant Energy](#)
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Facts on the Pollution caused by the US Coal Industry

# 10 Harsh Realities of the US Coal Industry

Excerpted from the Union of Concerned Scientist [Clean Energy report](#)

You can download a PDF version by going here: [Facts on the pollution caused by the US Coal Industry](#)

28

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A typical-sized 500 megawatt coal-fired electricity plant in the United States puts out each year:

- 1. 3.7 million tons of carbon dioxide.** Carbon dioxide (CO2) is the main greenhouse gas, and is the leading cause of global warming. There are no regulations limiting carbon dioxide emissions in the U.S.
- 2. 10,000 tons of sulfur dioxide.** Sulfur dioxide (SOx) is the main cause of acid rain, which damages forests, lakes and buildings.
- 3. 10,200 tons of nitrogen oxide.** Nitrogen oxide (NOx) is a major cause of smog, and also a cause of acid rain.
- 4. 500 tons of small particles.** Small particulates are a health hazard, causing lung damage. Particulates smaller than 10 microns are not regulated, but may be soon.
- 5. 220 tons of hydrocarbons.** Fossil fuels are made of hydrocarbons; when they don't burn completely, they are released into the air. They are a cause of smog.
- 6. 720 tons of carbon monoxide.** Carbon monoxide (CO) is a poisonous gas and contributor to global warming.
- 7. 125,000 tons of ash and 193,000 tons of sludge from the smokestack scrubber.** A scrubber uses powdered limestone and water to remove pollution from the plant's exhaust. Instead of going into the air, the pollution goes into a landfill or into products like concrete and drywall. This ash and sludge consists of coal ash, limestone, and many pollutants, such as toxic metals like lead and mercury.
- 8. 225 pounds of arsenic, 114 pounds of lead, 4 pounds of cadmium, and many other toxic heavy metals.** Mercury emissions from coal plants are suspected of contaminating lakes and rivers in northern and northeast states and Canada. In Wisconsin alone, more than 200 lakes and rivers are contaminated with mercury. Health officials warn against eating fish caught in these waters, since mercury can cause birth defects, brain damage and other ailments.
- 9. Trace elements of uranium.** All but 16 of the 92 naturally occurring elements have been detected in coal, mostly as trace elements below 0.1 percent (1,000 parts per million, or ppm). A [study](#) by DOE's Oak Ridge National Lab found that radioactive emissions from coal combustion are greater than those from nuclear power production.
- 10. A 500 megawatt coal-fired electrical plant burns 1,430,000 tons of coal, uses 2.2 billion gallons of water and 146,000 tons of limestone a year.**

Attachment	Size
<a href="#">10 Harsh Realities of the US Coal Industry.pdf</a>	16.19 KB





## 2013 News Releases

### EPA Proposes to Reduce Toxic Pollutants Discharged into Waterways by Power Plants

Release Date: 04/19/2013

Contact Information: Stacy Kika (News Media Only), Kika.stacy@epa.gov, 202-564-0906, 202-564-4355

**WASHINGTON** — In accordance with a consent decree and in line with requirements under the Clean Water Act, the U.S. Environmental Protection Agency (EPA) today will propose a range of options to help reduce dangerous pollutants, including mercury, arsenic, lead, and selenium that are released into America's waterways by coal ash, air pollution control waste and other waste from steam electric power plants. Today's proposal includes a variety of options for whether and how these different waste streams should be treated. EPA will take comment on all of these options, which it will use to help inform the most appropriate final standard.

Steam electric power plants currently account for more than half of all toxic pollutants discharged into streams, rivers and lakes from permitted industrial facilities in the United States. High exposure to these types of pollutants has been linked to neurological damage and cancer as well as damage to the circulatory system, kidneys and liver. Toxic heavy metals do not break down in the environment and can also contaminate sediment in waterways and impact aquatic life and wildlife, including large-scale die-offs of fish.

"America's waterways are vital to the health and well-being of our communities," said Acting Administrator Bob Perciasepe. "Reducing the pollution of our waters through effective but flexible controls such as we are proposing today is a win-win for our public health and our economic vitality. We look forward to hearing from all stakeholders on the best way forward."

EPA has put a focus on ensuring any final rule would protect public health while being sensible and achievable, and in line with that goal, under every preferred option proposed by EPA today, more than half of America's coal fired power plants would be in compliance without incurring any additional cost.

The proposal updates standards that have been in place since 1982, incorporating technology improvements in the steam electric power industry over the last three decades as required by the Clean Water Act. The proposed national standards are based on data collected from industry and provide flexibility in implementation through a phased-in approach and use of technologies already installed at a number of plants. Under the proposed approach, new requirements for existing power plants would be phased in between 2017 and 2022, and would leverage flexibilities as necessary.

Fewer than half of coal-fired power plants are estimated to incur costs under any of the proposed preferred options, because many power plants already have the technology and procedures in place to meet the proposed pollution control standards.

The four preferred options differ in the number of waste streams covered (such as fly ash handling systems, treatment of air pollution control waste and bottom ash), the size of the units controlled and the stringency of the treatment controls to be imposed. EPA estimates that the regulations would reduce pollutant discharges by 470 million to 2.62 billion pounds annually and reduce water use by 50 billion to 103 billion gallons per year.

EPA also announced its intention to align this Clean Water Act rule with a related rule for coal combustion residuals (CCRs, also known as "coal ash") proposed in 2010 under the Resource Conservation and Recovery Act. The two rules would apply to many of the same facilities and would work together to reduce pollution associated with coal ash and related wastes. EPA is seeking comment from industry and other stakeholders to ensure that both final rules are aligned to reduce pollution efficiently and minimize regulatory burdens.

There are approximately 1,200 steam electric power plants that generate electricity using nuclear fuel or fossil





# Effect of pollution on high-voltage outdoor insulators

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1 Author(s)

Lambeth, P.J. ; CEEGB, Central Electricity Research Laboratories, Research & Development Department, Leatherhead, UK

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High-voltage insulators may flashover at working voltage when polluted and wet. Pollution is deposited by various forces, of which aerodynamic ones are shown to be usually the most important. Theories to explain the pollution-flashover process are described. The performance of insulators in a polluted environment may be assessed by tests in natural conditions, or by the use of artificial methods, which are critically examined. The influence of a number of parameters, such as surface conductivity, overall length, leakage-path length and profile on insulator flashover is discussed. Studies of the effect of voltage waveshape show that direct voltage gives flashover at the lowest peak stress for a given pollution severity. Pollution flashover can be prevented by washing or greasing or by employing oil-bath or resistive-glazed insulators or special insulator assemblies. The advantages and disadvantages of these remedies are outlined. An analysis of the behaviour of polluted surge diverters and insulators with special functions introduces extra problems which are discussed. Organic insulating materials are degraded by tracking or erosion, but insulators using these materials have advantages, especially for ultra-high-voltage systems. An important aspect of the pollution problem which needs further study is the measurement of the site-pollution severity, so as to classify insulation requirements, and several methods of measurement are described.

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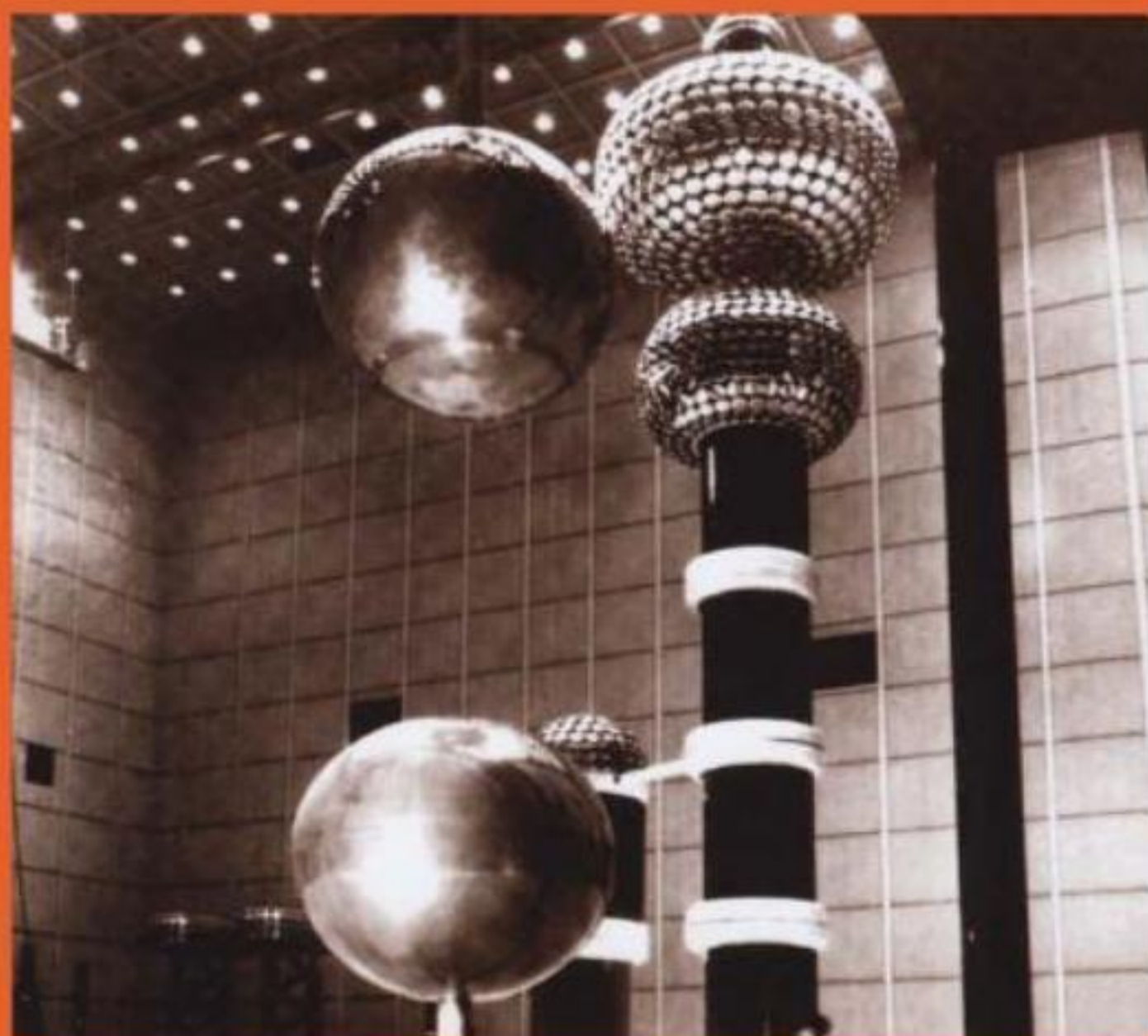
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# High Voltage Engineering: Fundamentals



E. Kuffel  
W. S. Zaengl  
J. Kuffel



Newnes











Environmental and Resource Economics

September 2000, Volume 17, Issue 1, pp 109-123

# Air Pollution and 'Dirty' Industries: How and Why Does the Composition of Manufacturing Output Change with Economic Development?

Matthew A. Cole

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## Abstract

This paper examines the impact on air pollution of changes in the composition of manufacturing output in developed and developing countries.

Pollution emissions from manufacturing output are estimated in a manner which holds constant the effect of technology and regulations allowing the impact of *compositional changes alone* on pollution to be estimated. The paper has three main findings; (1) the inverted-U estimated between per capita income and the pollution intensity of GDP arises due to both the composition of manufacturing becoming cleaner and the share of manufacturing output in GDP falling. Compositional changes alone are not responsible for the inverted-U between per capita income and per capita emissions; (2) changes to the composition of manufacturing output are consistent with the pollution haven hypothesis, however there is clear evidence that rising per capita incomes are associated with a falling income elasticity of demand for 'dirty' products. This fact may explain the compositional changes that occur with development; (3) in addition to the income elasticity effect, the analysis suggests that land prices and to a lesser extent the prices of labour and capital, determine the proportion of dirty industry within a country's manufacturing sector.



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## Resource and Energy Economics

Volume 19, Issues 1–2, March 1997, Pages 139–174



## Electricity restructuring and regional air pollution ☆

Karen Palmer , Dallas Burtraw

Resources for the Future, 1616 P Street, NW, Washington, DC 20036, USA

[http://dx.doi.org/10.1016/S0928-7655\(97\)00002-X](http://dx.doi.org/10.1016/S0928-7655(97)00002-X), How to Cite or Link Using DOI[Permissions & Reprints](#)[View full text](#)

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## Abstract

This paper investigates the regional air pollution effects that could result from new opportunities for inter-regional power transmission in the wake of more competitive electricity markets. The key determinant of changes in electricity generation and transmission is the relative cost of electricity among neighboring regions. The key determinant of how much additional power would be traded is the uncommitted electricity transfer capability between regions, including its possible future expansion. The changes in emissions of  $\text{NO}_x$  and  $\text{CO}_2$  that result from changes in the utilization of existing coal-fired facilities are modeled as a function of the average emission rate for each pollutant in each region, coupled with assumptions about the extent of displacement of coal-fired generation in the importing regions. We employ an atmospheric transport model to predict the changes in atmospheric concentrations of nitrates as a component of particulate matter (PM-10) and  $\text{NO}_x$  in each region (but not changes in ozone), as well as changes in  $\text{CO}_2$  emissions.

Our findings suggest that, in the year 2000, emissions of  $\text{NO}_x$  could increase by 213 000 to 478 900 t as a result of restructuring. The changes in  $\text{NO}_x$  emissions should be considered in the context of an expected *decrease* in annual emissions of over 2 million t that will result from full implementation of the 1990 Clean Air Act Amendments over the next few years; nonetheless, these changes would have adverse health effects. Consequences for increased  $\text{CO}_2$  emissions range between 75 and 133.9 million t. Changes in pollutant concentrations resulting from changes in  $\text{NO}_x$  emissions (excluding secondary ozone changes) would be substantially greater in regions where generation is increasing than in neighboring regions.

## JEL classification

L94; Q25; Q28

## Keywords

Air pollution; Electricity restructuring; Transmission

There are no figures or tables for this document.

☆ The authors are both Fellows in the Quality of the Environment Division at Resources for the Future. They







Excerpted from

## Modern Wind Turbines Generate Dangerously "Dirty" Electricity

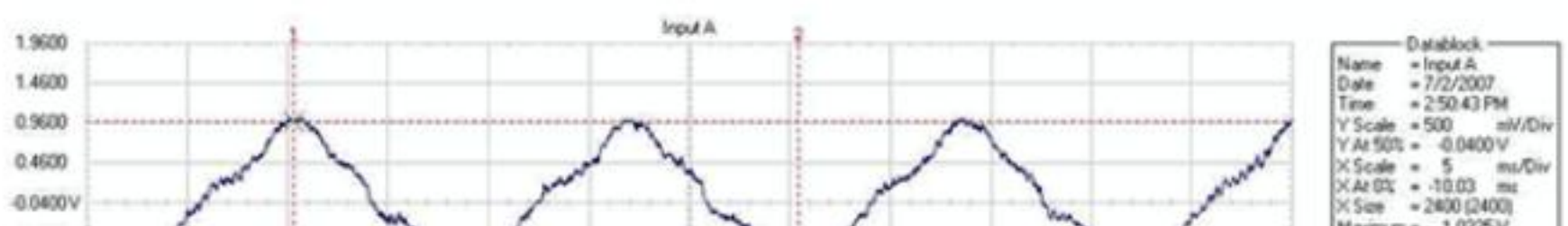
By Catherine Kleiber

Waveforms and picture courtesy of David Colling

Wind turbines are causing serious health problems. These health problems are often associated, by the people having them, with the flicker and the noise from the wind turbines. This often leads to reports being discounted.

Residents of the area around the Ripley Wind Farm in Ontario where Enercon E82 wind turbines are installed feel that the turbines are making them ill. Residents suffer from ringing in the ears, headaches, sleeplessness, dangerously elevated blood pressure (requiring medication), heart palpitations, itching in the ears, eye watering, earaches, and pressure on the chest causing them to fight to breathe. The symptoms disappear when the residents leave the area. Four residents were forced to move out of their homes, the symptoms were so bad. Residents also complain of poor radio, TV and satellite dish reception. There is no radio reception under or near the power lines from the wind turbines because there is too much interference. Local farmers have found that they get headaches driving along near those power lines.

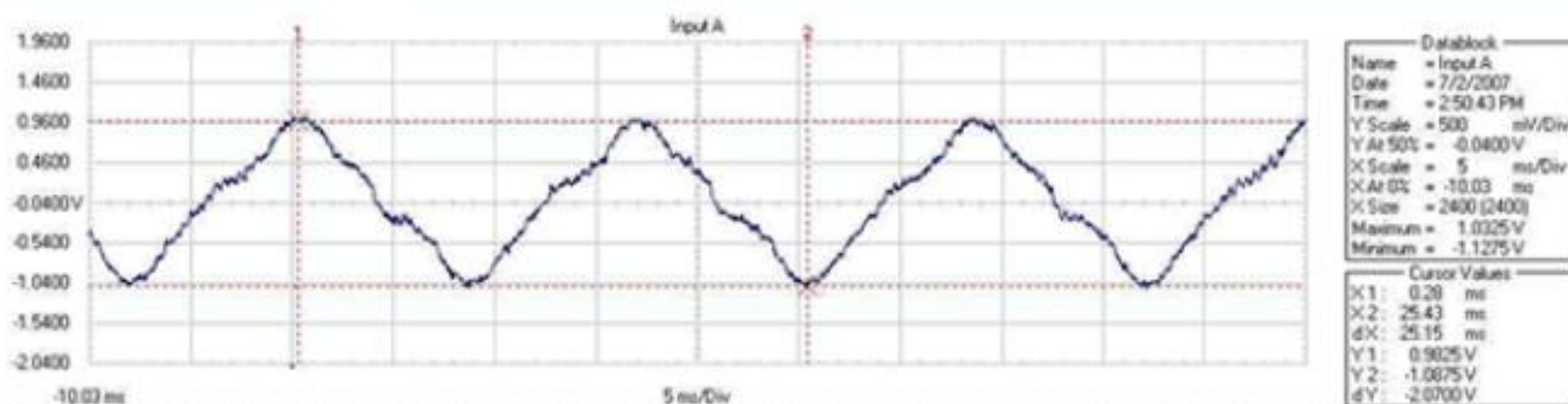
The waveforms below were taken at one of the residences in the area. The first waveform was taken before the wind farm started operation. (As you can see, a ground current problem existed even before the wind farm started.) The frequency profile of the neutral to earth voltage changed dramatically after the wind farm became operational (second waveform). There are far more high and very high frequencies present; indicated by the increased spikiness of the waveform.



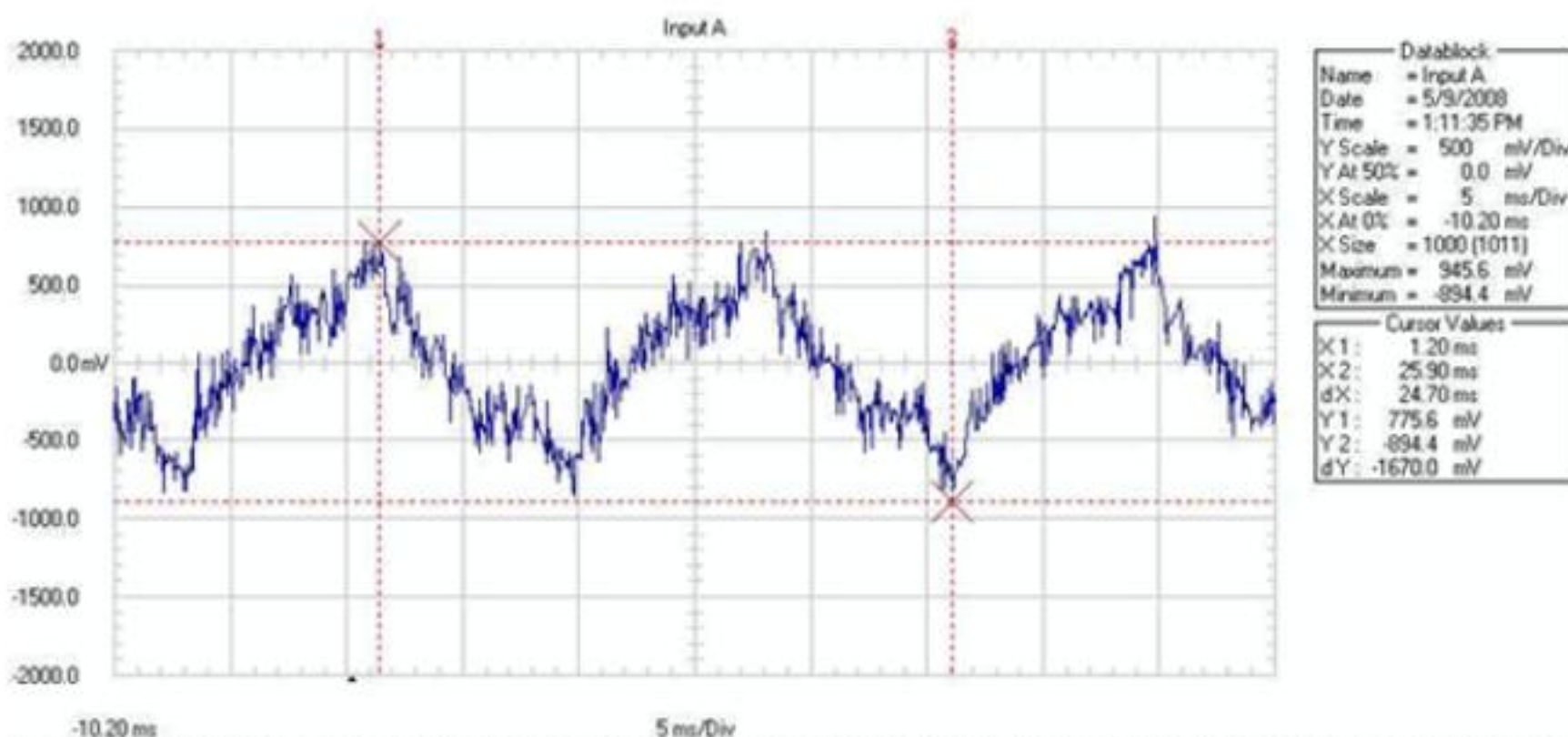
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Residence #3, Primary Neutral to remote ground rod, before windmills were installed and running.

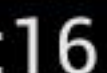
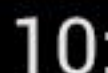
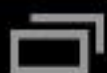


Residence #3, Primary Neutral to remote rod, windmills running before the collection line was buried.

As demonstrated by these waveforms, wind turbines are extremely electrically polluting. Studies and anecdotal reports associate electrical pollution with a similar set of symptoms to those experienced by the residents of the area (1, 2, 3). The symptoms associated with electrical pollution are caused by overexposure to high frequencies and are known as radio wave sickness (4). Technical papers discuss the fact that it requires only very small amounts of high frequency signals (either from transients or communications) on wiring to induce significant electrical currents in the human body. They support findings of human health problems caused by exposure to even small amounts of high frequencies (5, 6). The specific symptoms experienced depend on both the frequencies present and the body type and height of the person being exposed. Increased risk of cancer is associated with exposure to both "dirty" power on wires and electrical ground currents (7, 8). Animals also experience health problems related to electrical pollution exposures. Dairy cow's milk production and health suffers as exposure to high frequency transients increases (9, 10).

Suncor and Acciona have tried to some degree to correct the problem at the Ripley Wind Farm. They buried the collector line from the turbine near some of the most badly affected homes and gave the homes a separate distribution line. They also put an insulator between the neutral line and the grounding grid for the wind farm. As you can see, from the waveform below, it helped somewhat. It reduced the high frequencies being induced on the distribution system by the proximity of the collectors and the high frequencies put directly on the neutral by the tie to the wind farm grounding grid. However, it is still not as good as before the wind farm installation and neither is their health.

This is not the only wind farm that seems to be causing serious health problems for local residents. The Enercon E82 does not seem to be unique in its design or problems. Wind







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## Energy Policy

Volume 37, Issue 11, November 2009, Pages 4500–4513



## Rejecting renewables: The socio-technical impediments to renewable electricity in the United States

Benjamin K. Sovacool

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<http://dx.doi.org/10.1016/j.enpol.2009.05.073>, [How to Cite or Link Using DOI](#)

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### Abstract

If renewable power systems deliver such impressive benefits, why do they still provide only 3 percent of national electricity generation in the United States? As an answer, this article demonstrates that the impediments to renewable power are socio-technical, a term that encompasses the technological, social, political, regulatory, and cultural aspects of electricity supply and use. Extensive interviews of public utility commissioners, utility managers, system operators, manufacturers, researchers, business owners, and ordinary consumers reveal that it is these socio-technical barriers that often explain why wind, solar, biomass, geothermal, and hydroelectric power sources are not embraced. Utility operators reject renewable resources because they are trained to think only in terms of big, conventional power plants. Consumers practically ignore renewable power systems because they are not given accurate price signals about electricity consumption. Intentional market distortions (such as subsidies), and unintentional market distortions (such as split incentives) prevent consumers from becoming fully invested in their electricity choices. As a result, newer and cleaner technologies that may offer social and environmental benefits but are not consistent with the dominant paradigm of the electricity industry continue to face comparative rejection.

### Keywords

Renewable energy; Renewable electricity; Renewable power



10:17 AM







## Dirty electricity, chronic stress, neurotransmitters and disease

Samuel Milham<sup>1</sup> [smilham@dc.rr.com](mailto:smilham@dc.rr.com), David Stetzer<sup>2</sup>  
[...]

Electromagnetic Biology and Medicine

DOI: 10.3109/15368378.2012.743909

### ABSTRACT

Dirty electricity, also called electrical pollution, is high-frequency voltage transients riding along the 50 or 60 Hz electricity provided by the electric utilities. It is generated by arcing, by sparking and by any device that interrupts current flow, especially switching power supplies. It has been associated with cancer, diabetes and attention deficit hyperactivity disorder in humans. Epidemiological evidence also links dirty electricity to most of the diseases of civilization including cancer, cardiovascular disease, diabetes and suicide, beginning at the turn of the twentieth century. The dirty electricity level in a public library was reduced from over 10 000 Graham/Stetzer (G/S) units to below 50 G/S units by installing plug-in capacitive filters. Before cleanup, the urinary dopamine level of only one of seven volunteers was within normal levels, while four of seven phenylethylamine levels were normal. After an initial decline, over the next 18 weeks the dopamine levels gradually increased to an average of over 215 µg/g creatinine, which is well above 170 µg/g creatinine, the high normal level for the lab. Average phenylethylamine levels also rose gradually to slightly above 70 µg/g creatinine, the high normal level for the lab. Neurotransmitters may be biomarkers for dirty electricity and other electromagnetic field exposures. We believe that dirty electricity is a chronic stressor of electrified populations and is responsible for many of their disease patterns.

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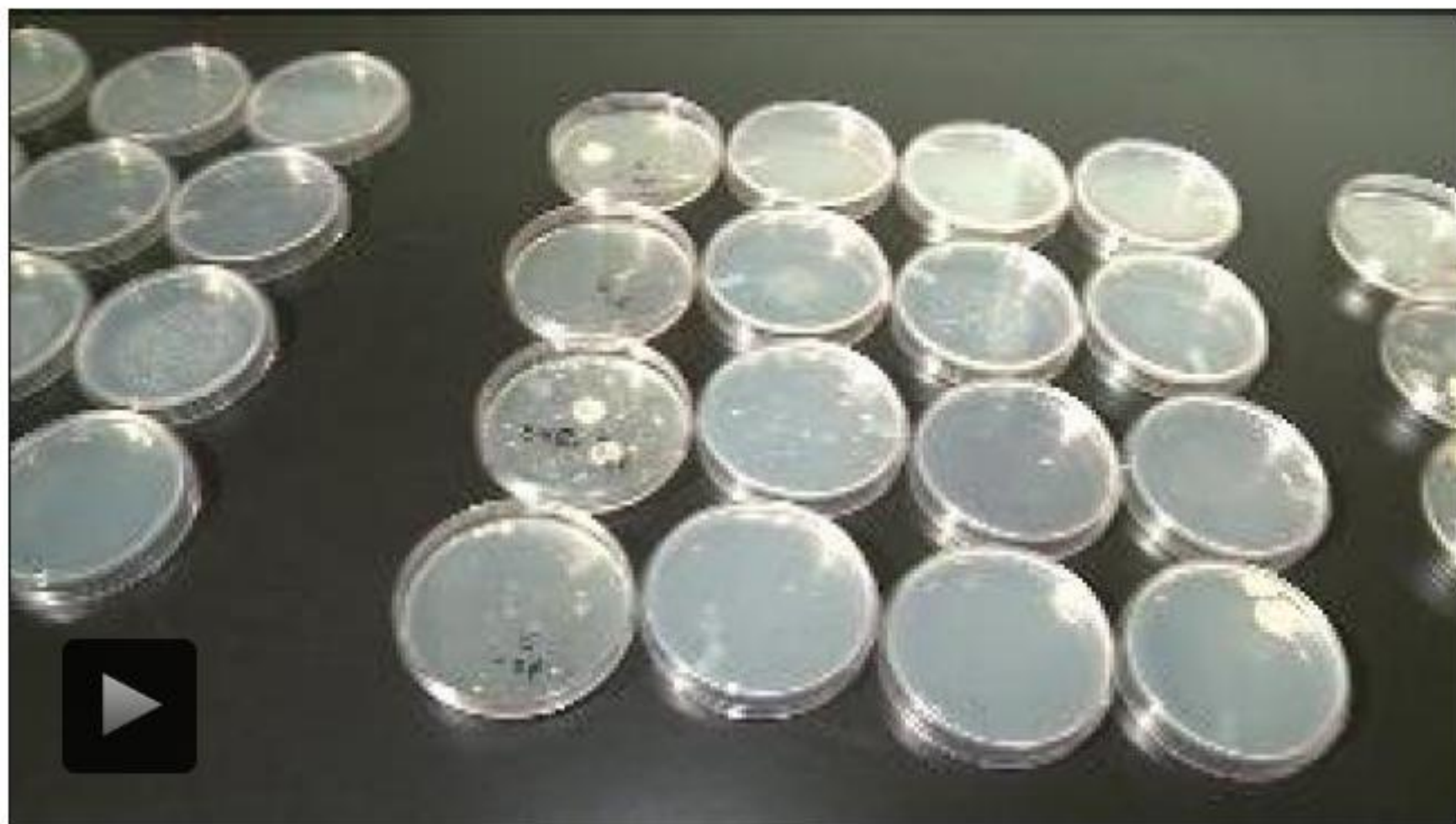


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## Contact 6: How dirty is your cell phone?

Posted on: 10:19 pm, February 17, 2013, by [Katrina Cravy](#), updated on: 09:06am, February 18, 2013

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MILWAUKEE (WITI) — There are more cell phones than people in the United States, and many can't imagine life without one. FOX6's Contact 6 performed a swab test, to see just what is on these devices many of us have in our hands every day.

FOX6's Contact 6 swabbed six cell phones for bacteria.

The official swabs came from ST Analytical Laboratories in New Berlin. The tests looked for general bacteria and E. Coli — because at least 75% of people have used their cell phones in the bathroom.

When the tests were performed and the samples sent off to the lab, microbiologist Gill Kelley said fairly high counts were found on a few of the cell phones.

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## The dirty little secret of the cell phone industry

June 20, 2013 By [puretalkusa](#) [Leave a Comment](#)

Pssst — come here! We've got a dirty little secret to tell you that many cell phone service providers don't want you to figure out.

But first, imagine this scenario...

You've found a great deal online for a new, unlocked smartphone. It's the perfect device for you to check and respond to emails, maybe upload a few pictures here and there to [Facebook](#), or even even fire off a few Tweets if that's your thing. All you need now is a no contract cell phone plan with data.

You proceed to do some research in hopes of finding the best deal to suit your needs and you come across a couple deals that offer you unlimited data usage! You're thinking, "Awesome!" right? You will have a virtual all-you-can-eat buffet of data consumption — so you think.

That brings us to the dirty little secret we previously mentioned: **data throttling**.

For many carriers that offer "unlimited" data, somewhere in the fine print you'll read that data is only "unlimited through x amount of data." Meaning that if you use too much data on their network, at a certain point your transfer speed will slow from that of a full-blast fire hose, to that of an annoyingly drippy faucet.

In an nutshell, that's called data throttling, and it has become a common practice for cell phone service providers who aim to limit data usage on their networks. Depending on the service provider, you could see throttling anywhere from 250MB to 2GB of data.



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## Dirty Cell Phone Talk

This entry was posted on February 6, 2012 by Pure Mobile.

By Aldo Panessidi

Following my '[Cell Phone and Bathroom Usage](#)' piece... I thought to research on the hygienic condition of typical cell phones and mobile devices.



You may want to brace yourself... for your [smartphone](#) and [mobile devices](#) are a petri dish accommodating and sustaining a thriving micro bacterial ecosystem. Dreadfully frightening isn't it?

In 2009, the prominent journal "Annals of Clinical Microbiology and Antimicrobials" conducted a study wherein they tested the various cell phones brands ([iPhone](#), [Blackberry](#), [Samsung](#), [Motorola](#), [HTC](#), [Nokia](#), [Sony](#), [LG](#), etc..) of 200 of their staff members. The results were alarming a whopping 94.5 percent of the devices were severely contaminated with various bacterial strains - many of which were resistant to multiple antibiotics. Moreover, the study yielded that over 60% of the bacteria thriving on the phones were ultimately transferred to the users.

When one considers that most users take their cell phones with them everywhere... including the bathroom. A startling 95% percent of common folk admitted to routinely using their [mobile device](#), [cell phones](#), [tablets](#), [laptops](#), notebooks and other media playing devices during toilet sessions... you can discover the statistics from a [study conducted by 11 Mark](#) in my previous blog on 'Cell Phone and Bathroom Usage'.

Microbes have been existing long before any other life form appeared on our planet. Their inherent ability to thrive and multiply in adverse conditions and hostile environments has fuelled their prolific growth and widespread presence throughout the world. Studies indicate their propensity to subsist in both highly populated regions and on public surfaces. Our entire bodies as well as public bathrooms, phones, computers, park benches, restaurant kitchen counters and tables are all ideal hosts harbouring a magnitude of microbe strains - with paper currency being found to have one of the highest concentration of bacteria. As such, it is plain to see that we are engaged in a true germ warfare... protecting our physical health against bacterial invasion.

Leaving your valuable mobile devices unprotected is risky! Discover the latest innovative protection solutions... stylish top brand [bags](#), [sleeves](#) and [cases](#) specifically designed to protect your devices from scratches and blemishes. Tough on the outside, sweet on the inside these brand name protection accessories combine complete device coverage with sleek artistic expression.

Wireless devices are excellent breeding grounds for bacteria... as they generate the requisite heat which helps promote and facilitate breeding. Furthermore, the majority of people do not think of routinely disinfecting their mobile devices, to this end, typical cell phones and mobile devices have more bacteria than toilet seats. I would highly recommend protecting both their devices and ultimately themselves with [iSkin protective accessories](#)' revolutionary Microban technology. Built-in to products during the manufacturing process, **Microban** antimicrobial product protection inhibits the growth of microbes such as bacteria, mold and mildew that can cause stains , embarrassing odors and deterioration of both cell phones and other mobile devices.







# Tech Talker

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## Should I Keep My Landline Phone?

Episode 50: October 24, 2012

[Technology](#) | [General](#)by [Eric Escobar](#)

Who doesn't have a cell phone these days? It would actually be tough to find someone who doesn't have some sort of mobile device. This brings up a question many households are asking:

"Do we really need a landline anymore?"

This question is one that I've had to help my parents answer in recent months and thought it would make a great podcast topic for my listeners.

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### Why You Should Get Rid of Your Landline

So let's go over some of the obvious arguments why you would want to get rid of your landline. First off is the price. It isn't unusual for a phone line to cost over \$40 a month and in the course of a year, that comes to almost \$500. Now you're probably thinking, "Great podcast [Tech Talker](#). I could have figured that out myself. If it's that expensive and unnecessary, I should just ditch it, right?"

Not so fast! There are some benefits to having a landline that may not be so obvious at first glance.

### Why You Should NOT Get Rid of Your Landline

The first things to consider are how the members of your household would get along without a landline. While you might have your fancy new [smartphone](#), there may be others in your family who do not have a cell phone (such as young children, or the elderly) and who use the landline as their primary telephone. In the case of an elderly person, they may only know how to use a landline and may not want to learn how to use a cell phone.

Next, think of how convenient it is to have

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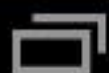
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#### About the Host:

Tech Talker, Eric Escobar, is a graduate of Cal Poly, San Luis Obispo. He received his civil engineering Master's degree from California State University, Fresno. In addition to his studies, he has also been the Director of Technology at Plan Life Wealth Inc. for the past three years. When he's not tangled in wires and cords you will find Eric fishing, backpacking, and maybe even launching rockets and beekeeping!



10:49 AM





ANDROID

# Do you ever wonder how dirty your cell phone really is?

Taylor Martin

- Member

@PhoneDog\_Taylor

Published: Nov 16, 11 4:55 PM

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The cell phone has quickly evolved from a novelty item to a staple in our daily lives. Never do we leave our phones at home, much less on the table or in our pockets for any extended amount of time. We bring our pocket-sized computers everywhere we go – even in to the restroom – and are constantly thumbing through our Twitter timelines, friends' shared photos and a seemingly endless supply of mobile games.

It should come as no surprise that those tiny, harmless devices are some of the dirtiest, germ-infested devices and objects of all. It has been echoed around the Web for years now, and it only makes sense; our phones are the one thing we constantly touch before and after all of the sneezing, handshakes, contact with public restrooms and door handles and whatever else the germ-filled world can throw at us.

Zoe Fox of *Mashable* shared an infographic (yes ... another one of *those* dreaded things) from *Keeping It Klean* on Tech Germs. The infographic goes through random bacterial infestation information like how light switches have roughly 217 bacteria per square inch and how computer keyboards are five times dirtier than toilet seat. But the most boggling

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# Phoning it in: the dirty secret of IP calling, and how it will change the phone industry

By Paul Miller on February 9, 2012 01:33 pm ✉ Email



Imagine you're watching PBS right now and *Bill Nye The Science Guy* comes on. Suddenly Bill Nye's disembodied head is floating across your screen, with 1s and 0s streaming in and out of his ears.

"Did you know," shouts Bill Nye (I don't know why he's shouting, but he is), "that when you make a cellular phone call your voice is transmitted as digital data, just like how a CD or DVD stores information?"

You change the channel. You knew this already, Bill. Everybody knows this. And yet when you make a phone call from your couch, to tell your friend that Bill Nye is "losing his edge," the digital data of that phone call isn't routed over Wi-Fi through your home's fat internet pipes. Instead your carrier confronts some laws of physics and gets those 1s and 0s from the little brick in your hand to a cellular tower that's miles away, which then sends the call over a mess of wires, pipes, and lines that dates back to Alexander Graham Bell himself. It's all very impressive, but who are they trying to impress? Certainly not your dormant Wi-Fi router, certainly not your bitrate-weathered ears, certainly not Bill Nye.

Unless, of course, you use T-Mobile's Wi-Fi calling service. Fun fact: T-Mobile has a service called "Wi-Fi calling."



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# Touchscreen Cell Phones Are Really, Really Dirty

By [Jane McEntegart](#) OCTOBER 15, 2010 7:50 PM - Source: [Tom's Guide US](#)**Has everyone had his or her flu-shot?**

Smartphones might be great for keeping up with email and your various different social networking pages while you're on the go, but damn, those touchscreens are wicked dirty.

If you're in the habit of bringing your smartphone to the toilet with you, you probably know that it's not that clean. But did you know that the average mobile phone has 18 times the amount of germs on a toilet flush handle? Yeah, and I bet you don't use your foot to send text messages in public.



The Sacramento Bee cites figures from a study in Britain in reporting the toilet handle fact but reminds us that we have more to worry about now that touchscreen phones are so widely available. Timothy Julian, a doctoral student from Stanford University, warns smartphone owners to not let anyone else touch their phone because they might catch something as a result.

"If you're sharing the device, then you're sharing your influenza with someone else who touches it," Julian, doctoral student and co-author of a study on the spread of viruses, told the Sacramento Bee.

"If you put virus on a surface, like an iPhone, about 30 percent of it will get on your fingertips," he revealed. In turn, "a fair amount of it may go from your fingers to your eyes, mouth or nose," the mostly likely entrance ways for infection.

Guess we should all be invest in some hand sanitizer.

Source: [Sacramento Bee](#) via [Engadget](#)

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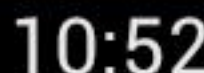
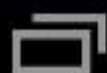
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## How Dirty Are Doctors' Cellphones?

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Research has found that the cellphones of doctors, nurses and other hospital workers are as dirty as some toilet bowls. A study from Ondokuz Mayis University that was published in the *Annals of Clinical Microbiology and Antimicrobials* found that 95 percent of doctors' cellphones had bacteria on them, and one in eight had the superbug methicillin-resistant staphylococcus aureus (MRSA) on them. MRSA is reported to be the cause of as much as 60 percent of hospital infections in the United States. Cellphones in general have been found to have the dirtiest surface of anything in the home, possibly because they are often used close to the skin and because the heat from the skin and the battery provides a good environment where bacteria can grow.

### More facts about cellphones and hospitals:

- The study also found that almost half of the cellphones had at least two types of bacteria on them, and that only one in 10 doctors cleaned their cellphones regularly.
- Although there is a risk of spreading infection via cellphones, most of the bacteria on the phones probably would not be harmful to a healthy person, because humans live in bacteria-rich environments on a daily basis. The main risk might come more from the location than the presence of the bacteria — people in doctors' offices and hospitals often have compromised immune systems.
- Studies have shown that when a person picks up a cellphone, about one-third of the germs on the phone transfer to the hand and face.

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# EMF Radiation + Dirty Electricity + Cell Phone Radiation

by AscendedVitality | 36 videos

Over 2000 scientific studies link EMF Radiation exposure to many adverse health conditions and diseases is very compelling. The World Health Organization or WHO says that "Electrical Hypersensitivity" (EHS), an allergic-like reaction to Electric and Magnetic Fields (EMFs), is a growing worldwide health concern. Several forward-thinking governments have already taken steps to protec...



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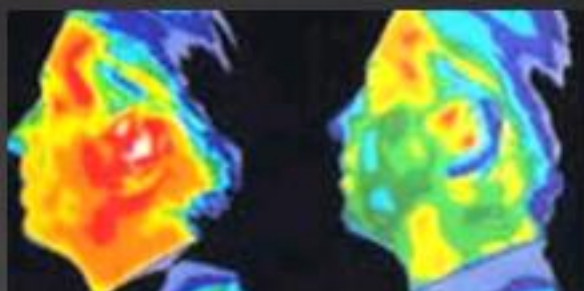


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